PERSONAL COMPUTING

SEPTEMBER 1981
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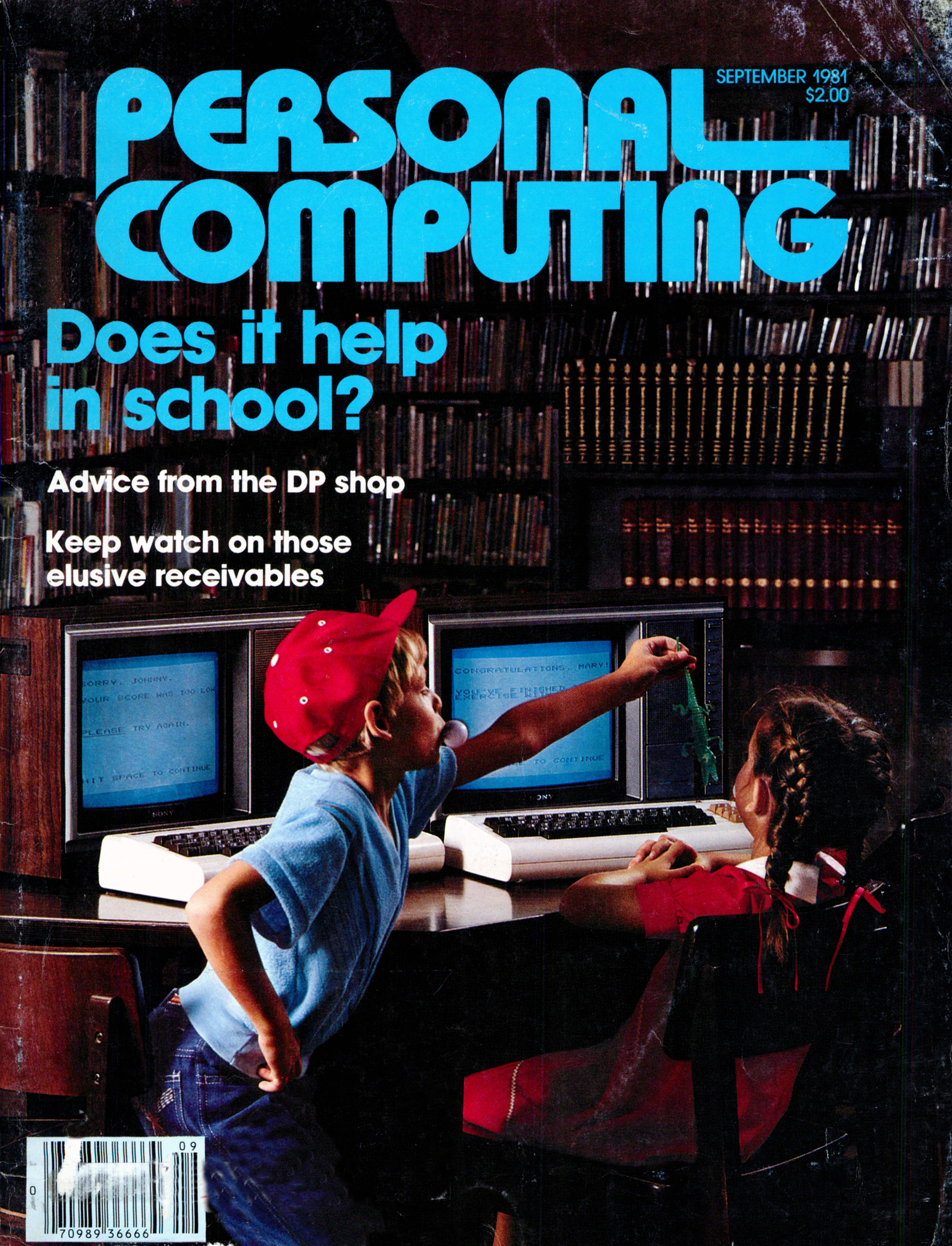
Does it help in school?

Advice from the DP shop

Keep watch on those elusive receivables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CIRCLE 1

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CIRCLE 2

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September 1981
Vol. V. No. 7

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COVER PHOTO BY STEVE EISENBERG

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BEHIND THE COVER

You might be pleasantly surprised if you're able to get a computer into your child's school. It can really help the kids learn. But there are many problems to be overcome before the situation changes from that shown on the cover to that shown on page 44.

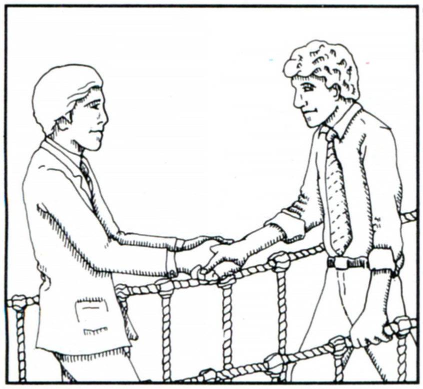
ILLUSTRATION BY JANET KROENKE

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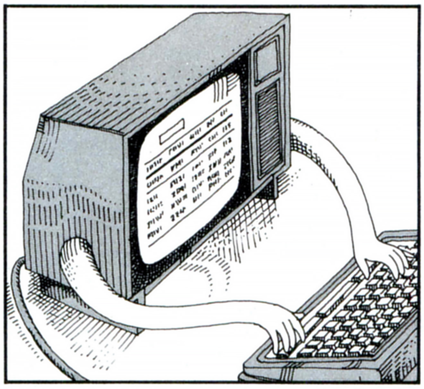

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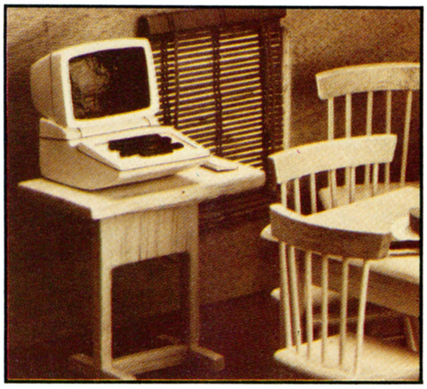
PHOTO BY STEVE SAGALA

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FEATURES

25 BID FAST, BID SMART TO WIN THAT CONTRACT
BY W. B. GOLDSMITH, JR. When you walk into a businessman's office to offer a project bid, you want to win that contract. This routine's output has that "computers are always right" quality to help ease your half of the contract negotiations.

30 PERSONAL COMPUTERS IN BUSINESS—THE VIEW FROM THE DATA-PROCESSING SHOP
BY KEN MCLAMB You may have decided to join the ranks of businessmen who have decided to use a personal computer. Do you know how best to use it? How best to choose the one to buy? Here's advice from the people in the data-processing shops. They've had to do it before.

44 "WHAT DID YOU DO IN COMPUTER CLASS?"
BY LEE THÉ Is computer literacy that important? The answer to this question seems to be yes, so parents are now fighting to get personal computers into their children's schools.

57 LET YOUR COMPUTER DO THE PROGRAMMING
BY TODD ZIPNIK Program generators are very versatile packages that can ease your programming tasks by saving you time and effort. And they're getting more versatile as time goes by.

64 22 WAYS TO RULE RECEIVABLES
BY ROBERT L. PERRY An accounts-receivable ledger is one of the most important records a business owner has. Many software companies have packages that can computerize that ledger to simplify your bookkeeping tasks. See what's available and compare their various features.

90 MODEMS: YOUR LINE TO THE WORLD
BY STANLEY VEIT AND DAVID GABEL A modem and a personal computer can put the whole world within your reach. Read about the features of a modem and compare the equipment on the market today.

104 COMPUTERS IN THE HOME COME OF AGE
BY KEN MCLAMB Personal computers have captured the imagination of thousands of families.They are discovering all of the different tasks a computer can perform for them in the home.

PERSONAL COMPUTING (ISSN 0192-5490) is published monthly by Hayden Publishing Company, Inc., 50 Essex St., Rochelle Park, NJ 07662. James S. Mulholland, Jr., President. Printed at World Color Press, Inc., Mt. Vernon, IL. Second class postage paid at Saddle Brook, NJ and at additional mailing offices. Copyright © 1981, Hayden Publishing Company, Inc. All rights reserved. POSTMASTER: Please send form 3579 to PERSONAL COMPUTING, P.O. Box 13916, Philadelphia, PA 19101. Subscription rates: U.S. 1 year (12 issues) $18; 2 years (24 issues) $33; 3 years (36 issues) $46. Canada & Mexico: add $4/year for surface mail, $8/year for airmail. Other countries: add $8/year for surface mail, $36/year for airmail. Back issues: U.S.: $4. All other countries: $5.

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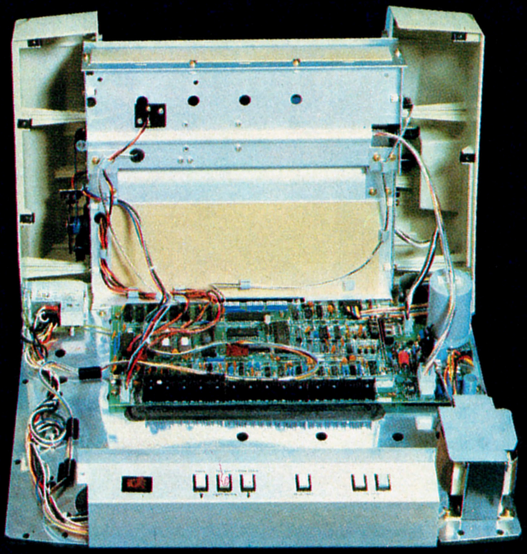

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CIRCLE **3**

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EDITORIAL

Spirit is A' movin

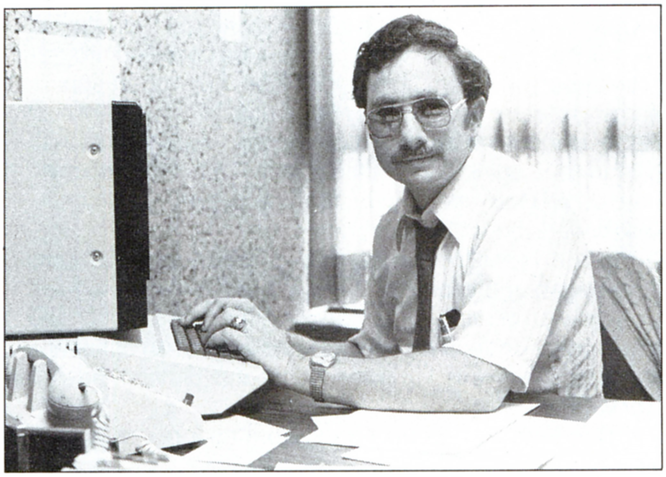

PHOTO BY KENNETH W. SCHROERS

I wasn't politically active in the sixties. I was, after all, making a career out of Uncle Sam's Army.

But recently I listened to a telecast of a Peter, Paul and Mary concert, and hearing all the old songs brought back the feelings I'd had in those days. The times changed us all.

Some of us will remember a song Arlo Guthrie did in the latter part of the decade called "Alice's Restaurant." In that song, Arlo suggested that if a man (no females considered) were to avoid the draft, he could perform a series of mildly bizarre actions at the induction center, culminating in the rendering of a few bars of the refrain from the song, and then just walk out. He suggested that if 1000 people were to do just that, "Why they just might think it's a movement."

I don't think that particular phase of the movement ever got anywhere, but it was fun to think about it.

There's a movement going on today. It's not anti-anything—it's for personal computers. I'll give two examples to show what I mean.

Our cover story this issue asks and then answers the question, "Does personal computing help in the school?" And the answer is, "You bet." Ordinary parents are cooperating with teachers and school authorities to get personal computers into the schools, and more importantly, into the hands of children once the machines are in the school. This kind of activity is becoming widespread. People are beginning to believe that personal computers can do children a lot of good in the schools. It's becoming a movement.

And indeed, personal computers are being bought. Not just to go into the school, but into the workplace, where information workers see that their productivity can go up, and they buy the machine. And in the professional world, where the machines are gaining a firmer and firmer foothold. And on the farm. And in the home.

Bought despite the fact that it may be difficult to get the right one.

I went to a computer store the other day, went inside and a man asked if he could help. I told him what I wanted and he said he didn't know about that, I should talk to the expert in that field.

Over came the expert. He recommended one particular package. But he said he didn't have that package. Then why did he recommend it? He said all his customers told him it was the best. Well what did he have for that application? He pointed out another package. Could he demonstrate it? He'd never run it before, but he said we could struggle through it together.

The last time I heard about people struggling together was in the sixties.

I didn't buy anything in that computer store that day, but others are. Every day. A lot. And they're struggling together to make personal computers work for them. If that isn't a movement, I don't know what is.

Arlo should be proud.

David Gabel

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CIRCLE 4

PERSONAL COMPUTING

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FEEDBACK

Modeling Changes

Dear Editor:

Congratulations on a thorough, in-depth article, "Financial Modeling Software: Tools for the Overworked Manager." Robert Perry did an excellent job in finding out just what financial-modeling software is available and discussing the strengths and weaknesses of each package.

Since that article was written, we have made some changes in our product—RCS—that was mentioned. We've changed its name to Micro-DSS/Finance (DSS/F for short), and Addison-Wesley Publishing Company has rewritten the users' reference manual and added a separate tutorial manual for the beginning user. Addison-Wesley will begin distributing DSS/F through dealers by the end of June, so it should be widely available by the time this letter is published.

Mr. Perry's comments on the desirability of an interface to a data base-management system and to a general ledger system were quite relevant. We hope to announce products or enhancements along these lines by the end of the year.

Rusty Luhring
President
Ferox Microsystems
Arlington, VA

Radiation Info

Dear Editor:

I read your article "Are Computers Hazardous to Your Child's Health?" in the May, 1981 issue of *Personal Computing* and feel it is a worthwhile topic to cover.

However, there seems to be a serious error in your calculation of the radiation dose from the CRT. The intensity of the radiation varies as $1/r^2$ when r is the distance from the source—for point sources only. Things are different for extended sources, when the distance is comparable to the dimensions of the source. For example, the intensity of the radiation from an infinite flat surface is independent of the distance. An example is the electric field of a flat conductor.

I have devised a sample computation—numerical integration over a screen measuring 20 x 30 cm. When the intensity is 0.5 mrem/hour at a distance of 5 cm, then the intensity at a distance of 39 cm is 32 percent or 0.16 mrem/hour. This sums up to a yearly dosage, under your assumption of one hour exposure per day, of 58 mrem per year, or 16 times your value.

Therefore, radiation from CRTs can be a very serious problem, as this figure is more than half of the "natural" background radiation. For professionals, who work much longer than one hour per day at a CRT, the situation is still worse.

Alois Treindl
Zurich, Switzerland

Up to Date

Dear Editor:

Personal Computing is to be commended on the comprehensive article, "Financial Modeling: Tools for the Overworked Manager" in the June issue. However, as the developer of FPL, I'd like to bring a correction to your attention:

1. The current version of FPL has up to 400 rows and columns, i.e., 10 columns and 390 rows (with 56k memory).
2. The earlier version cited in your article, which was never released, had 10 columns and 160 rows (with 48k memory).

Once Again, thank you for the service *Personal Computing* is providing to personal-computer users.

Dennis Brown
Thousand Oaks, CA

The Other Side

Dear Editor:

Russell Garrard (Feedback, June, 1981) may not care to read about "word processors and data base programs," but I can tell you that as a non-hacking personal computer user, I *need* those articles.

There are increasing numbers of us who simply cannot find out how software works simply by trying it, because the manufacturers are mass marketing personal computers as the solution to all small business and human service agency data problems. The one thing they forget is that most of us don't speak "computerese" and are not hobbyist programmers.

Sales outlets are more interested in mass distribution than information and education, for the most part, and they are relatively uninformed about many of the finer points regarding whether a given piece of software will adapt to a user's specific needs and if so, how. I find that most of the manuals are filled with jargon and little interpretation. Usually, I can not figure out how to determine whether or not I can solve my problem with the software if that problem does not correspond directly with the examples given. (Software producers should be forced to have all of their literature pretested by users who are not programmers.)

Prospective automobile buyers read the car trial reports to find out what the experts think about new developments, and we micro fledglings need your help to sort out all the new developments for our computers. I would not buy a new applicance without checking it out in *Consumer's Guide* and several other sources, and I need your help in buying software.

Mr. Garrard should remember that as a personal-computer sales proliferate, there are probably more of us functional illiterates trying to wrestle the computer to the ground than there are knowledgable pros like him.

Babette Bloch
Mill Valley, CA

Another Opinion

Dear Editor:

I like Russell Garrard's go get 'em style. However, there are other opinions, as you well know. Mine is one.

It seems to me that Garrard is about due to receive his degree in economics as his thinking has progressed to the point where he believes it is proper to have taxes fund work that otherwise would be accomplished only if it could justify itself by meeting demand. He deserves a high mark from his economics professors for having absorbed their teaching that the tax money does not belong to those who pay it, but rather that tax money belongs to "government" and to anyone who can get government to spend it the way the recipient wants.

Actually, if someone wants to write programs—let him. More power to him if buyers will buy them. Since there are many unethical buyers, some will give out copies if they can, but there are many who will not, and these will prefer that copycats go buy their own. Price is an object here—maybe. So, allowing for the cheaters and the others, if a program is good enough and the price is low enough, then the volume of sales is great enough to make the programmer a heap of money. I cannot visualize my tax money being used to fund programmers to work on what they want, and not on what I want.

The future will hold many good programs which are written from the businessman's viewpoint and usefulness, because this is where the main body of competition will be, and the programs' prices will be competitive for what the programs will do.

T.G. Warfield
Reno, NV

...and Another

Dear Editor:

In the June, 1981 Feedback column, Mr. Russell Garrard expressed very strong opinions regarding the type of articles he considered fit for publication. My viewpoint contrasts sharply.

Like Mr. Garrard, I also subscribe to, purchase, or read many of the available computer periodicals. I expect different types of information from each one of them. Some overlap is unavoidable, but it isn't really appreciated.

I can think of few things more appropriate than exactly the thing for which Mr. Garrard expressed his "hate." Although I recently wrote such a recipe article for *PC*, the recipe aspect was nearly incidental. The primary intent was aimed toward furthering the reader's understanding of random access files, their structure, applications, and the program steps required to format, file, access, and modify such data. To the best of my knowledge, there are no tutorials on this topic. The only way to learn how to use such filing methods is to study published programs (preferably by typing them in), debugging them, and customizing them for your own application.

I think there is too wide a range of interests to want or expect one publication to do it all. I much prefer to have each establish an area of coverage and do that thoroughly and expertly. Let each subscriber then pick and choose from the available publications according to his personal preferences and interests.

John Chase Reed
Bellevue, WA

CALENDAR

SEPTEMBER

Sept. 10-13—THE MIDWEST COMPUTER SHOW; McCormick Place, Chicago, IL; Northeast Expositions Inc., 824 Boylston St., S 202 Chestnut Hill, MA 02167; (617) 739-2000.

Sept.14-17—INFOSYSTEMS NATIONAL SOFTWARE PACKAGE CONFERENCE & EXPOSITION; Merchandise Mart Expocenter, Chicago, IL; Hitchcock Publishing Co., Hitchcock Bldg., Wheaton, IL 60187; (312) 665-1000.

Sept. 19-21—SUNBELT COMPUTER EXPOSITION; Phoenix Civic Plaza, Phoenix, AZ; Judco Enterprises, 5823 N. Invergordon Rd., Scottsdale, AZ 85253; (602) 991-8622.

Sept. 23-24—BUSINESS COMPUTING '81; Masonic Auditorium, San Francisco, CA; West Coast Computer Faires, 333 Swett Rd., Woodside, CA 94062; (415) 851-7075.

Sept. 24-27—SECOND ANNUAL MID-ATLANTIC COMPUTER SHOW; Washington's D.C. Armory, Washington, DC; The National Computer Shows, 824 Boylston St., Chestnut Hill, MA 02167; (617) 739-2000.

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CIRCLE 5

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CIRCLE 7

Bargain Basement To Open

The Computer Store, Inc. has joined the ranks of major U.S. discount merchandisers with the opening of the first "computer bargain basement" in Sudbury, MA. The first of several such stores to be opened on the East Coast, the bargain basement will sell used computers, demo models and discontinued equipment.

Weekly bargain center price lists will be made available in all regular Computer Store outlets for those customers who cannot travel to Sudbury. Those purchasers can mail in a check and their equipment will be shipped to them.

Curriculum Ideas Sought

Position papers are being called for by the Association for Computing Machinery concerning the role of microcomputers and other small computer systems in the curriculum of community and junior colleges. Selected papers will be included in a small systems workshop to be held in conjunction with the ACM 1981 Annual Conference in Los Angeles, November 9-11, 1981.

Computer professionals and educators are invited to submit papers which suggest subjects that should be offered or describe what the author has done or would like to do with small computers in the curriculum. Papers may concern personal computers, small business computers, small scientific computers, or microprocessor systems, and can be in the form of ideas, opinions, abstracts, outlines of courses, survey results, curriculum revisions, or position statements not yet implemented.

Papers are due no later than September 15, 1981. They should be sent to Mr. Jack Dineen, ACM CAJC Curriculum Group, Department of Computer Science, Middlesex County College, Edison, 08817.

Getting Personal Computers in the Class

Last January, the College of Education at Arizona State University hosted a special microcomputer conference designed to introduce educators and administrators to the many applications of microcomputers in the classroom. The conference proceedings are now available in a 340-page booklet including over 30 articles. Further information can be obtained from Dr. Gary Bitter, Arizona State University, Payne B203, Tempe, AZ 85287.

MIT Looking For Software

The Massachusetts Institute of Technology is accepting applications from software distributors for the licensing of the Apple LOGO Educational Software System.

Companies interested in further licensing information should contact: Patent, Copyright & Licensing Office, Massachusetts Institute of Technology, 77 Massachusetts Ave., Room E19-722, Cambridge, MA 02139.

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CIRCLE 8

OUTLOOK

Computer Clubs for Kids

Sharing the fun of a home computer with other kids is what 13-year-old Larry Muller expects to get from a new organization designed to give young people a sense of purpose and their own national organization through which they can explore the computer and share their experiences.

Called the Young People's LOGO Association, the organization has a secondary purpose: to become a clearinghouse, or library, of information on the use of personal computers to educate the handicapped. Larry's father, Jim Muller, one of the association's founders, is determined to find out what learning-disability specialists, teachers and parents who have ventured into home computing to aid the handicapped have learned. This aspect of the organization will include a computer network incorporating software used in special education classes, other programs developed for the education and training of the handicapped, plus lists of agencies and others that are applying the personal computer to the education of the disabled.

Why a "LOGO" Association?

The use of computers in education has traditionally cast the computer as a teacher and the student as a passive learner of the computer's lesson. While this approach is useful for teaching a present curriculum, it does little to stimulate young peoples' creative skills or their ability to learn through the natural process of exploration and discovery.

An alternative to this approach is to have youngsters learn the intricacies of BASIC, Pascal, or other high-level languages. These tend to be overly complex for young people. LOGO is a straight-forward, easy-to-use computer language that offers a discovery-oriented approach to learning that can attract and hold young peoples' attention, stimulate their interest in the learning process, and get them involved in a creative way.

TI LOGO is the first implementation of LOGO on a personal computer. It is a philosophy of education developed over a 12-year period by Dr. Seymour Papert and the staff of the Artificial Intelligence Laboratory at the Massachusetts Institute of Technology. At the heart of LOGO is the concept of creating computer-based environments in which the learning of mathematics and other subjects can take place in a natural way through the process of exploration, trial and error, and discovery. Many of LOGO's premises are based on the work of the late Jean Piaget, a noted Swiss authority on childhood learning. TI LOGO is the result of a cooperative effort between the MIT staff and Texas Instruments. And although YPLA will concentrate on LOGO, it will also be actively involved with other readily available programming languages.

Software exchange

LOGO procedures can be exchanged by mail or over the TI software exchange that will be available on TEXNET, the home information and communication service developed by Texas Instruments in conjunction with Source Telecomputing Corporation. To exchange software via TEXNET requires a telephone acoustic coupler,an RS-232-C Interface, and a Terminal Emulator II command module. In addition to the software exchange, other information including the YPLA newsletters will be available via TEXNET.

Membership

Young people under the age of 19 can join at no charge. They will receive a membership certificate and card, monthly newsletters describing the activities of the YPLA, tips on LOGO procedures and programming in other languages, plus information on microelectronic technology—written in young peoples' terms. Different sections of the newsletter will serve the interests of different age groups.

Adults wishing to join the organization are asked to pay $15 per year to help defray operational expenses. They receive the benefits of the young peoples' membership plus an additional newsletter written as an instructional aid. This will contain instruction suggestions on the information covered in the young peoples' newsletter, references of other educational programs, as well as il-

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CIRCLE 9

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CIRCLE 10

lustrative material that can be readily duplicated for class and home use.

Young peoples' activities, including the software exchange, will start operations at the beginning of the 1981-82 school year. For additional information on the activities and plans for the Young Peoples' LOGO Association, contact James H. Muller, President, YPLA, 1208 Hillsdale Dr., Richardson, TX 75081; (214) 783-7548.

MicroPlan For Financial Planning

VisiCalc has become the standard against which small-computer financial-planning software is judged. Now Chang Labs' MicroPlan is making a bid for similar status in the world of CP/M-based high-end personal computers.

Chang Labs has been shipping MicroPlan since March and had an installed base of over 500 by mid-July, according to the manufacturer. Dash Chang, MicroPlan's author, claims that "MicroPlan is easier to use than VisiCalc, yet contains capabilities surpassing mainframe financial-planning packages."

Altos Computer Systems seems to agree. Altos has signed an agreement to distribute MicroPlan—along with Wordstar and MP/M—as a heavily discounted package option for its new System 10 personal computer.

So have several other manufacturers. Durango Systems has released its version of MicroPlan along with its new CP/M-based Colt computer. Dynabyte has adopted MicroPlan as part of an optional integrated business package to be sold with Dynabyte series 5000 computers. The package will also include Wordstar and Business Manager, the latter including some half dozen commonly used accounting packages including general ledger, accounts payable and accounts receivable. "At least three other manufacturers will announce variants of MicroPlan as part of their product offerings in the coming months," says Chang. Chang Labs can supply versions of MicroPlan for the Gnat, SuperBrain, North Star and Cromemco computers, as well.

MicroPlan is an electronic worksheet with a unique "linear menu." The right side of the screen shows a column of commands. Users choose commands to enter date, descriptions and calculations directly into the electronic worksheet. One simple command prints a report. A 20-year forecast can be produced in two minutes.

MicroPlan also allows users to build complex models. The demonstration model included with the program prints an income statement, cashflow analysis and equity accumulation schedule for a hypothetical income-property investment. The model prompts for inputs, calculates taxes, mortgages and depreciation and generates a professional looking report.

For more information contact: Chang Laboratories, 10228 North Stelling Rd., Cupertino, CA 95014; (408) 725-8088.

FCC Rules To Take Effect Soon

Personal-computer buyers will soon see labels placed on their new equipment stating that it complies (or does not comply) with regulations promulgated by the Federal Communications Commission. Is this something we really need to worry about? Or is it merely another annoyance for us from the people in the federal government?

It really could be considered both. On the one hand, people who like to view television programs would prefer that their screens not be covered with all sorts of interference just because someone is using a personal computer nearby. On the other hand, one might argue that the simple removal of the offending piece of equipment might solve the problem without resorting to federal regulations.

At issue is an ammendment to part 15 of the commission's regulations. The ammendment defines computing equipment, sets two distinct classes of that equipment (one for personal computers and one for industrial-use computers), sets maximum allowable limits for conducted electromagnetic interference for both classes of equipment, and requires manufacturers to test their equipment for compliance with the limits. Manufacturers must also label the equipment, telling the user the status of the manufacturer's compliance effort.

Electromagnetic interference is any unwanted radiation that comes out of electric equipment. We have all been subject to static on the screen of a TV set (visible as snow) when an electric motor is running. This is one form of electromagnetic interference. It is caused by the rapid switching on and off

ST80-III The Ultimate Communications Package:
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This is our top of the line communication package. Full disk support including DOS commands have been implemented. ST80-III ™ has been on the market for over two years and has become the standard in TRS-80™ communication. This package has been used in a wide variety of applications including use with:
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The package includes the ST80-III™ smart terminal program and nine other communication utilities: Fully documented with easy to follow instructions, ST80-III™ is by far the best terminal product on the market today. Features:

1) User configurable communication tables
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3) Last line repeat
4) Formatted video (Page, Scroll & Formatted)
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10) Remote control of Memory open & close, Printer on & off, Video on & off & auto logon
11) Help display
12) User definable function keys

Host Communications: **Price $ 50.00**

This program is by far the best HOST program you can buy. It supports the PRINT @ statement for the remote TRS-80™ running any of the ST80™ smart terminal programs. All of the ST80-III™ advanced functions are supported by host allowing easy access via BASIC, Fortran and machine language programs. Host features include:

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4) Allow line feeds
5) Commands:
   a) Turn on RTS (request to send),
   b) Turn off RTS,
   c) Receive data only from terminal,
   d) Receive data only from host,
   e) Send data only to host,
   f) Send data only to terminal,
   g) Operate in dumb terminal mode,
   h) Operate in ST80™ mode,
   i) Check CTS status. (clear to send)

This is a self relocating subroutine that can load anywhere in high memory.

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CIRCLE 11

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STARBASE HYPERION™
By Don Ursem

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On Cassette — $19.95 On Diskette — $22.95

NAME THAT SONG
By Jerry White

Name that Song

Here is great entertainment for everyone! Two players listen while the Atari starts playing a tune. As soon as a player thinks he knows the name of the song, he presses his assigned key or joystick button. There are two ways to play. The first way requires you to type in the name of the song. Optionally, you can play multiple choice, where the computer asks you to select the title from four possibilities. The standard version requires 24K of RAM (32K on diskette) and has over 150 songs on it. You also get a 16K version that has more than 85 songs. The instructions explain how you can add songs to the program, if you wish. Written in BASIC.

On Cassette — $14.95 On Diskette — $17.95

QS FORTH
By James Albanese

Want to go beyond BASIC? The remarkably efficient FORTH programming language may be just for you. We have taken the popular fig-FORTH model from the FORTH Interest Group and expanded it for use with the Atari Personal Computer. Best of all we have written substantial documentation, packaged in a three ring binder, that includes a tutorial introduction to FORTH and numerous examples. QS FORTH is a disk based system that requires at least 24K of RAM and at least one disk drive. Five modules that may be loaded separately from disk are the fig-FORTH kernel, extensions to standard fig-FORTH, an on-screen editor, an I/O module that accesses Atari's operating system, and a FORTH assembler.

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CIRCLE 12

OUTLOOK

of the AC current that is driving the motor as the bars of the commutator on the motor are first brought into contact, and then removed from contact with the motor's brushes. The rapid switching action causes the conducting of electronic noise back into the power line. It is picked up at the plug of the television set, and interferes with the signal-processing circuits that provide the picture.

When the interfering object is a motor, the remedy is simple enough. Turn off the motor, and the interference goes away.

But the remedy isn't so simple if the offending object is your neighbor's CB radio, to which he has added an illegal amplifier so that he can talk to Des Moines, Iowa from New York. That's why the FCC put output-power restrictions on CB radios.

And that's why the Commission has regulated the amount of interference allowed from a personal computer and its peripherals.

The new regulations define a computing device as "Any electronic device or system that generates and uses timing signals or pulses at a rate in excess of 10,000 pulses (cycles) per second and uses digital techniques; inclusive of telephone equipment that utilizes digital techniques or any device or system that generates and utilizes radio frequency energy for the purpose of performing data processing functions, such as electronic computations, operations, transformations, recording, filing, sorting, storage, retrival [sic], or transfer. Radio transmitters, receivers, industrial, scientific and medical equipment and any other radio frequency device which are specifically subject to an emanation requirement elsewhere . . . are excluded from this definition."

That definition certainly includes personal computers. But there's more. Personal computers are what are called Class B devices defined as follows.

"A computing device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environment. Examples of such devices that are marketed for use by the general public."

The new regulation further defines a personal computer as one that is marketed for use in the home, whether it can be used for business applications or not. And any computer that uses a TV set as display device or meets any of several other criteria are considered examples.

The point of all this definition is that personal computers, among other devices that fall into the Class B definition must meet stricter standards than do Class A devices. Class B devices can con-

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CIRCLE 13

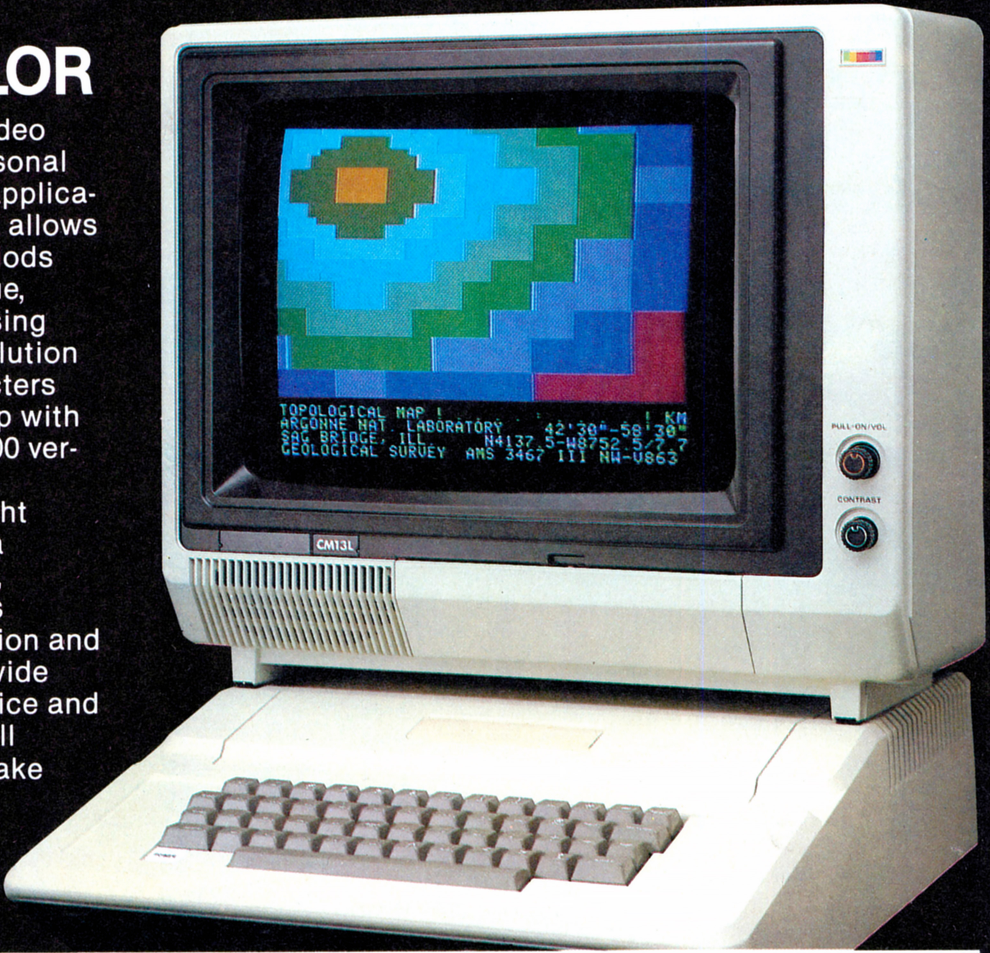
04
Radio Shack
TRS-80
COLOR VIDEO
4

AMDEK Professional Color & B/W Monitors

NEW 13″ COLOR

The Amdek 13″ Color Video Monitor is ideal for all personal and business computing applications. Bright jitter-free text allows viewing over extended periods without causing eye fatigue, especially in word processing applications. The low resolution display provides 40 characters wide by 24 characters deep with 260 horizontal lines and 300 vertical lines.

This compact, lightweight monitor (only 25 lbs.) has a molded-in carrying handle, making it easy to move. Its industrial grade construction and shatter resistant case provide reliable service in both office and industrial environments. All front mounted controls make it easily adjustable at a glance without the loss of a single keystroke.



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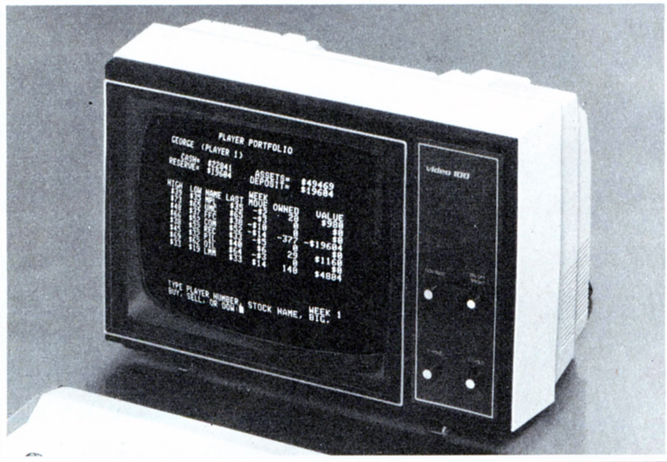

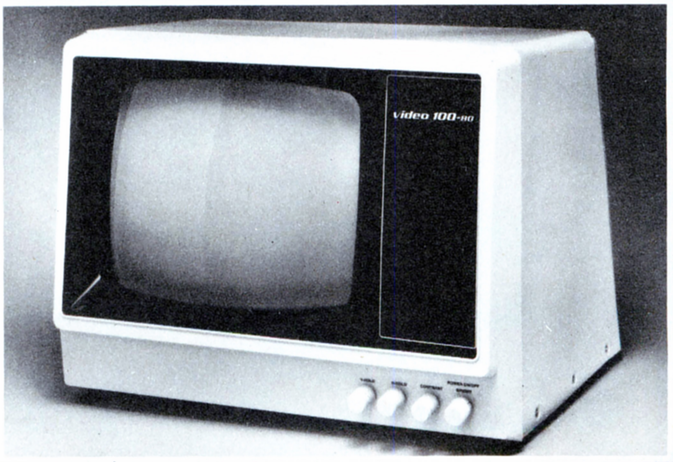

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CIRCLE 14

duct EMI back into the power line of not more than 250 microvolts over the frequency range of 450 to 30,000 kHz. Class A devices, on the other hand can conduct either 1000 or 3000 microvolts into the line, depending on the frequency of the emission.

So the stricter requirements on personal computers, which are sold for use in the home, are designed to protect the home user from unwanted interference.

It's something to check for. All devices manufactured for sale as Class B devices after October 1981 must be labelled as to their compliance with the new regulations. Look for the label. At least you'll know.

Radio Shack Making Play To Go To School

Radio Shack's Education Division is engaged in an extensive courseware-development effort to support the use of the TRS-80 personal computer in schools. The computers are now being used extensively in Fort Worth, TX, and Philadelphia, and Radio Shack is working to help other schools gain finances for computers.

New required subject: computer literacy

Computer literacy is now a required subject at Nolan Catholic High School in Fort Worth, TX. Starting in the Fall of 1982, it will be mandatory for graduation. Twenty-one TRS-80 personal-computer systems are being used in both classroom and school-administration applications.

The school, under the direction of Brother Tony Pistone, SM, the school principal, has set up a

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☐ CREDIT CARD: Keep control of your cards with this program. Organizes, stores and displays purchases, payments and service charges. Screen or 40 column printer display. Up to 10 separate cards $14.95

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CIRCLE 16

OUTLOOK

computer center equipped with 15 of the personal computers. Two more computers are stationed in math classes.

Brother Pistone says that the teachers, students and parents are enthusiastic and supportive of the program. He expresses the importance of this new step: "The idea I would like to suggest is that reading, writing and arithmetic are the three R's of the past, and they are still the basic competencies. But computer literacy is perhaps the fourth R. We really look forward to preparing our students both for entering college and for entering life in terms of this almost basic skill."

The school accounting and payroll systems are set up on one of the TRS-80 Model II computers. Another Model II computer with a word-processing system is used for attendance records and in the development office.

Parents have responded to the computer program with such enthusiasm that an introductory computer night class has been established for adults.

Radio Shack will also be converting two minicomputer-based reading programs developed by the Philadelphia schools to the TRS-80 personal computer. Radio Shack will be licensed to distribute the reading programs, known as Computer Assisted Reading Development (CARD), and Systems Approach to Basic Reading Education (SABRE).

Computer Assisted Instruction (CAI) will be used for instruction in reading skills. The Philadelphia reading programs are designed to provide individualized, self-paced instruction in reading to students and are based on the use of established CAI techniques for using computers to supplement and reinforce regular classroom instruction.

These programs are designed to encourage positive attitudes toward learning, language and reading. The curriculum material is relevant and provides non-threatening, positive reinforcement in private sessions at the computer.

Developed originally by the Philadelphia schools for use with selected students who were reading below grade level, the system had been in use for 10 years and has had many revisions and improvements during that time. Research available as a result of the extensive use in the Philadelphia schools documents consistent gains in student achievement in reading as a result of the programs.

The planned availability date for the new

continued on page 141

Why use their flexible discs:

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Flexible Disc 1s Single-Headed Drives Single-Density Media	IBM Compatible (128 B/S, 26 sectors)	3060	2.19	5FD-111110	473071	53428	CM-F11	800506	2305830	40013	FD1-128	FD-1	740-0	S/A 100	15002	FD34-1000	F111111X	7870-K	421602
	IBM Compatible (128 B/S, 26 sectors) w/ W.P.N.	3062	2.24	–	–	–	–	–	–	–	–	–	740-0	–	–	–	–	–	–
	IBM Compatible (128 B/S, 26 sectors) w/ W.P.N. & Hub ring	3064	2.55	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	IBM Compatible (128 B/S, 26 sectors) REVERSIBLE	1729	3.35	5FD-113110	473072	54431	–	–	–	40015	–	FD-2	740/2-0	–	15150	FF34-2000	F171111X	7860-K	–
	IBM System 6 Compatible	3066	2.19	–	473077	54561	–	800509	1669959	40014	–	–	740-0 0S6	–	15003	FD60-1000	F116111X	–	–
	IBM Compatible (256 B/S, 15 sectors)	3109	2.19	5FD-111210	473073	–	–	800584	2305845	40040	–	–	740-3600	–	15005	FD36-1000	F112111X	7861-K	–
	IBM Compatible (512 B/S, 8 sectors)	3110	2.19	–	473074	–	–	800585	1669954	40044	–	–	–	–	15004	FD60-1000	F113111X	7889-K	–
	Shugart Compatible, 32 hard sector	3015	2.19	5FD-211010	470901	53802	CM-F21	101/1	–	40016	FH1-32	FD-132	740-32	S/A-101	15025	FD32-1000	–	7890-K	421322
	Shugart Compatible, 32 hard sector REVERSIBLE	3025	3.35	5FD-213010	–	–	–	–	–	40017	–	–	740/2-32	–	15151	FF32-2000	–	7880-K	–
	Wang Compatible, 32 hard sector w/Hub ring	3087	2.50	–	–	54491	–	–	–	–	–	–	740-32RM	–	–	–	F37A411X	–	–
	CPT 8000 Compatible	3045	2.79	–	–	–	–	–	–	–	–	–	–	–	15226	–	–	–	–
Flexible Disc 1d Single-Headed Drives Double-Density Media	IBM Compatible (128 B/S, 26 sectors)	3090	2.95	5FD-121010	474071	54568	–	3740/1D	–	40047	FD1-128/M2100	FD-1D	741-0	–	–	FD34-8000	F131111X	7857-K	423002
	Soft Sector (128 B/S, 26 sectors) REVERSIBLE	3093	3.99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Shugart Compatible, 32 hard sector	3091	2.95	5FD-221010	470801	54596	–	101/1D	–	40024	FH1-32D	–	741-32	S/A-103	15075	FD32-8000	F33A410X	7887-K	423322
	Shugart Compatible, 32 hard sector REVERSIBLE	3094	3.99	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Wang Compatible, 32 hard sector w/Hub ring	3088	3.20	–	–	–	–	–	–	–	–	–	–	–	–	–	F22A411X	–	–
Flexible Disc 2s Double-Headed Drives Single-Density Media	Soft Sector (Unformatted)	3101	3.84	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Soft Sector (128 B/S, 26 sectors)	3113	3.84	–	–	54428	–	800814	1766870	–	–	–	–	S/A-150	15153	FD10-4026	F121111X	–	–
	Soft Sector (256 B/S, 15 sectors)	3106	3.84	–	473477	54226	–	800815	2736700	40043	FD2-256D	–	742-0	–	15154	FD10-4015	F122111X	7856-K	424612
	32 Hard Sector	3108	3.84	–	–	–	–	–	–	–	FH2-32	–	–	–	–	–	–	–	–
Flexible Disc 2d Double-Headed Drives Double-Density Media	Soft Sector (Unformatted)	3102	3.49	–	473485	–	–	DY150	–	40028	FD2-XDM	FD-2D	743-0	–	15103	DD34-4001	–	–	425002
	Soft Sector (128 B/S, 26 sectors)	3115	3.49	–	–	–	–	–	–	–	–	–	–	S/A-150	–	–	–	–	–
	Soft Sector (256 B/S, 26 sectors)	3103	3.49	–	473471	54325	–	800817	1766872	40019	FD2-2560	–	743-0/256	–	15101	DD34-4026	F144111X	7858-K	425602
	Soft Sector (512 B/S, 15 sectors)	3114	3.49	–	473472	54479	–	800818	1669044	40039	–	–	743-0/512	–	15100	DD34-4015	F145111X	–	425612
	Soft Sector (1024 B/S, 8 sectors)	3104	3.49	–	473473	54485	–	800819	1669045	40020	–	–	743-0/1024	–	15102	DD34-4008	F147111X	7859-K	425622
	32 Hard Sector	3105	3.49	5FD-321010	470851	–	–	101/2D	–	40021	FH2-32D	–	743-32	S/A-151	15125	DD32-4000	F34A411X	7881-K	425322
	Burroughs B-80 Compatible 32 Hard Sector	3092	3.49	–	–	–	–	–	–	–	–	–	–	–	–	–	F34A611X	–	–
	Soft Sector (1024 B/S, 8 sectors) w/ Hub Ring	3116	3.75	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Flexible Disc FD Memorex 651 or Equiv. Drive Compatible	FD VI (Vinyl Jacket)	30712003	2.95	–	470651	–	CM-F31	FDIV	–	40002	–	FD-165	511-0	–	15026	FD65-1000	F61A111X	7910	–
Mini Flexible Disc 1s 5¼" Single-Headed Drives Single-Density Media	Soft Sector (Unformatted)	3401	1.99	–	475001	54256	–	104/1	–	40500	MD1	MD 1	744-0	S/A-104	15300	MD525-01	M11A211X	7897	441002
	10 Hard Sector	3403	1.99	–	475010	54257	–	107/1	–	40501	–	MD 110	744-10	S/A-107	15325	MD525-10	M41A211X	7898	441102
	16 Hard Sector	3405	1.99	–	475016	54258	–	105/1	–	40502	MH1	MD 116	744-16	S/A-105	15326	MD525-16	M51A211X	7899	441162
	Soft Sector (Unformatted) W/Hub Ring	3431	2.19	–	–	–	–	–	–	–	–	–	–	–	–	MD525-01	–	–	–
	10 Hard Sector, w/Hub Ring	3433	2.19	–	–	–	–	–	–	–	–	–	–	–	–	MD525-10	–	–	–
	16 Hard Sector, w/Hub Ring	3435	2.19	–	–	–	–	–	–	–	–	–	–	–	–	MD525-16	–	–	–
Mini Flexible Disc 1d 5¼" Single-Headed Drives Double-Density Media	Soft Sector	3417	2.24	–	–	54646	–	104/1D	–	–	–	–	–	–	–	MD540-01	–	–	–
	10 Hard Sector	3418	2.24	–	–	54649	–	107/1D	–	–	–	–	–	–	–	MD540-10	–	–	–
	16 Hard Sector	3419	2.24	–	–	54652	–	105/1D	–	–	–	–	–	–	–	MD540-16	–	–	–
Mini Flexible Disc 2d 5¼" Double-Headed Drives Double Density Media	Soft Sector	3421	2.74	–	–	54624	–	104/2D	–	–	MD2-D	–	745-0	S/A-154	–	MD550-01	–	–	–
	10 Hard Sector	3423	2.74	–	–	54627	–	107/2D	–	–	–	–	745-10	S/A-157	–	MD550-10	–	–	–
	16 Hard Sector	3425	2.74	–	–	54630	–	105/2D	–	–	MH2-D	–	745-16	S/A-155	–	MD550-16	–	–	–

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CIRCLE 17

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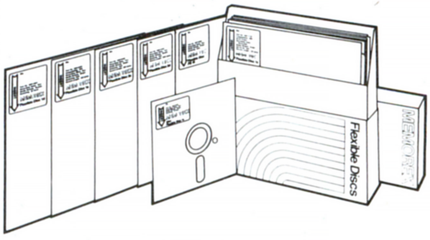

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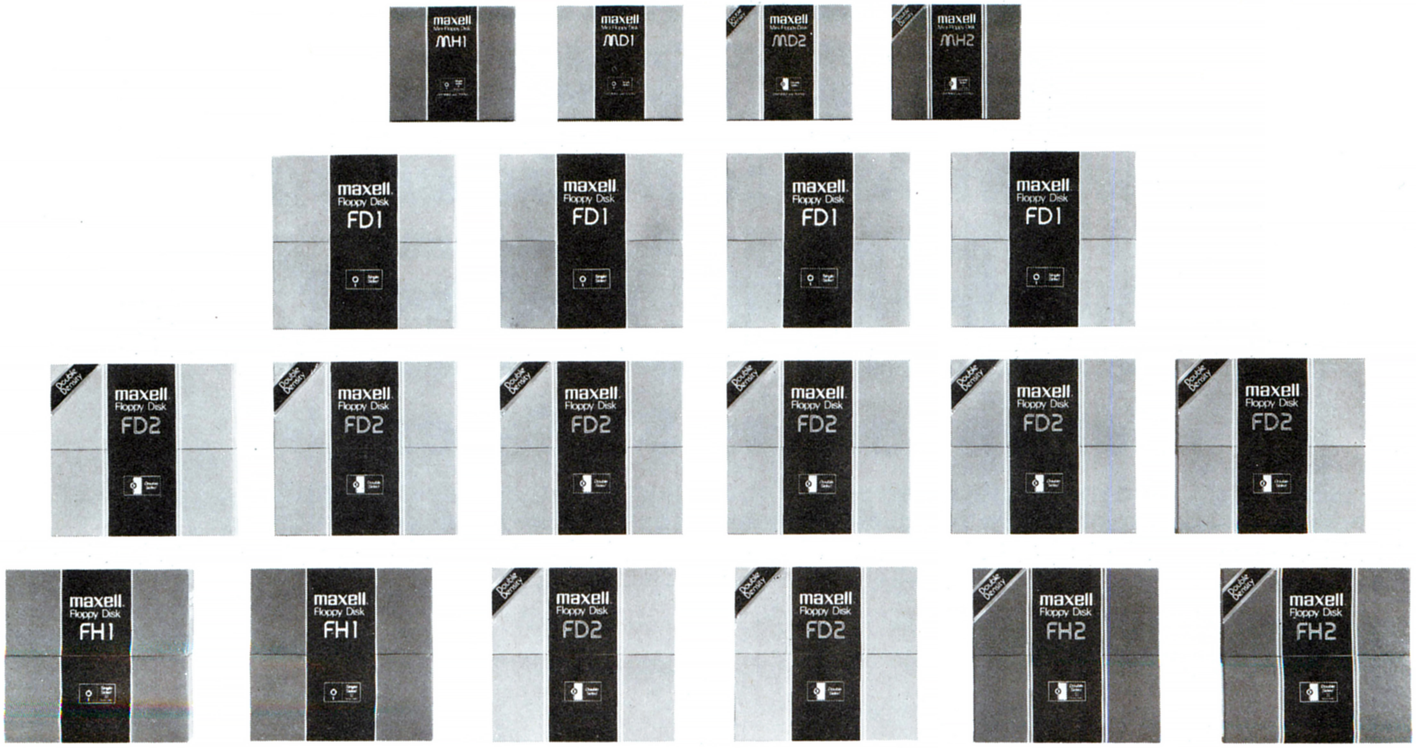

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CIRCLE 18

W.B. Goldsmith, Jr.

Bid Fast, Bid Smart To Win That Contract

Cost Proposal program gives business owners computing clout at the bargaining table.

Businesses that become involved in projects for clients often must submit a proposal before they can land the contract. For bidding in the thousand-dollar range, the back of an envelope may do. For multimillion-dollar projects, a multivolume cost and technical description is in order. But for jobs of $50,000 to $500,000, the back of an envelope isn't professional enough and a multivolume proposal may cost more to generate than the expected profit from the work. Cost Proposal, written in SWTP 8k BASIC 2.0, can fill the bill here.

This routine does not address the technical aspects of the job, but provides a multiple-page breakout of costs. It's a "plain vanilla" routine, designed to be changed easily. And the output has that intimidating "computers are always right" quality that will ease your half of contract negotiations with clients.

Patience pays

Most other BASICs with string-variable and matrix arithmetic capability should handle Cost Proposal easily. The one negative to entering this program is its length. You may

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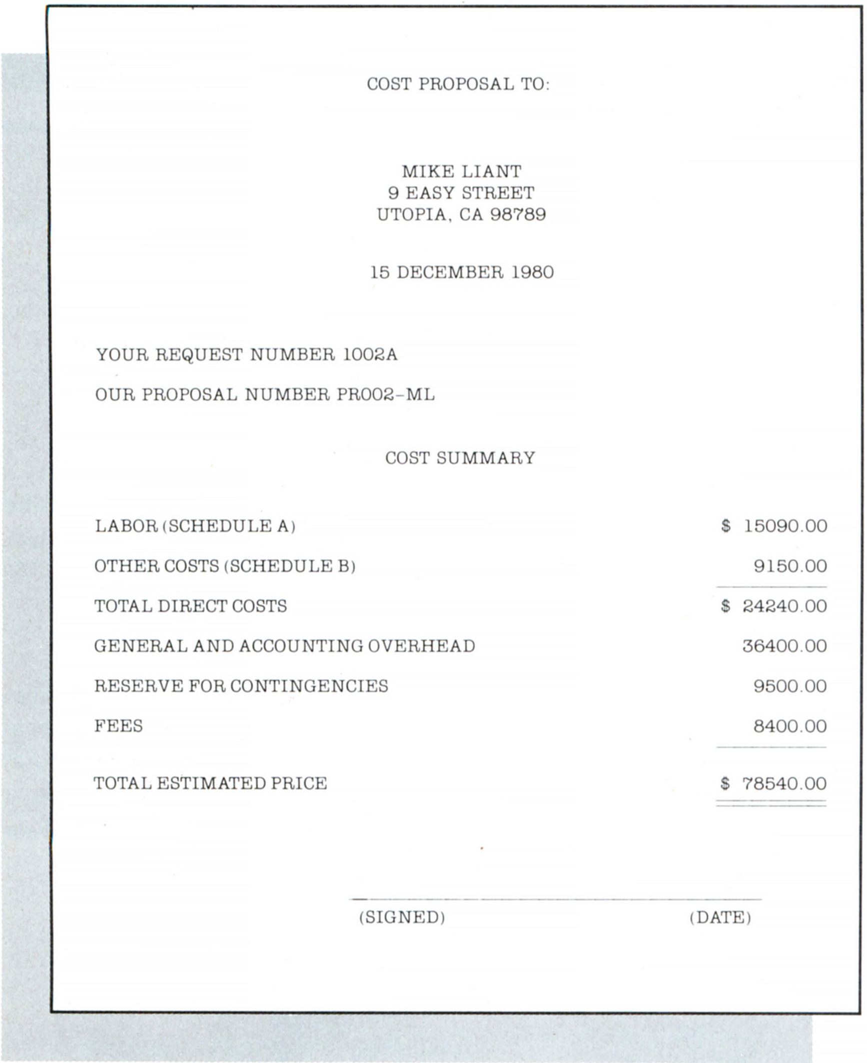
AUTOMATED COST PROPOSAL
ARONELLA



```
                    COST PROPOSAL TO:


                       MIKE LIANT
                     9 EASY STREET
                   UTOPIA, CA 98789

                   15 DECEMBER 1980


YOUR REQUEST NUMBER 1002A

OUR PROPOSAL NUMBER PR002-ML

                     COST SUMMARY


LABOR (SCHEDULE A)                              $ 15090.00

OTHER COSTS (SCHEDULE B)                           9150.00
                                                ----------
TOTAL DIRECT COSTS                              $ 24240.00

GENERAL AND ACCOUNTING OVERHEAD                   36400.00

RESERVE FOR CONTINGENCIES                          9500.00

FEES                                               8400.00
                                                ----------

TOTAL ESTIMATED PRICE                           $ 78540.00
                                                ==========



                  ________________________________________
                  (SIGNED)                          (DATE)
```

need a couple of evenings to get it all into memory, but you'll be well repaid the first time you generate a proposal. You may even find a profitable sideline in subcontracting proposal preparation to other small businesses in your area.

If you're on the other end of the contracting game, you can use Cost Proposal to help estimate what a subcontractor's bid should be and have your own intimidation factor at the negotiation table.

Cost Proposal may even prove useful for business loan applications and routine budget struggles in a medium-sized business, although this hasn't been tried yet.

As the sample run indicates, the program is easy to use. Cost categories are generally divided into "Labor" and "Other" fields. "Labor" is further broken into "Direct Labor" (employees) and "Subcontract Labor." Under "other costs," there are listings for "Direct Material Costs," "Other Direct Costs," and "Miscellaneous." The breakout will satisfy most business situations, but if it doesn't, the user can modify it.

Flexibility features

As the program is written, a user can enter up to 10 separate categories of "Direct Labor" and 10 "Subcontract Labor" fields. If more are needed, a short alteration of the routine will expand the bidding options. If fewer than 10 categories are needed, the user merely responds to the unneeded category prompts with a carriage return, and the routine moves on to the next field.

Cost Proposal includes a field for employer taxes and sales taxes on contract labor. The prompt asks for the percentages, and the routine calculates the amounts, based on the total dollar figures amassed in the category.

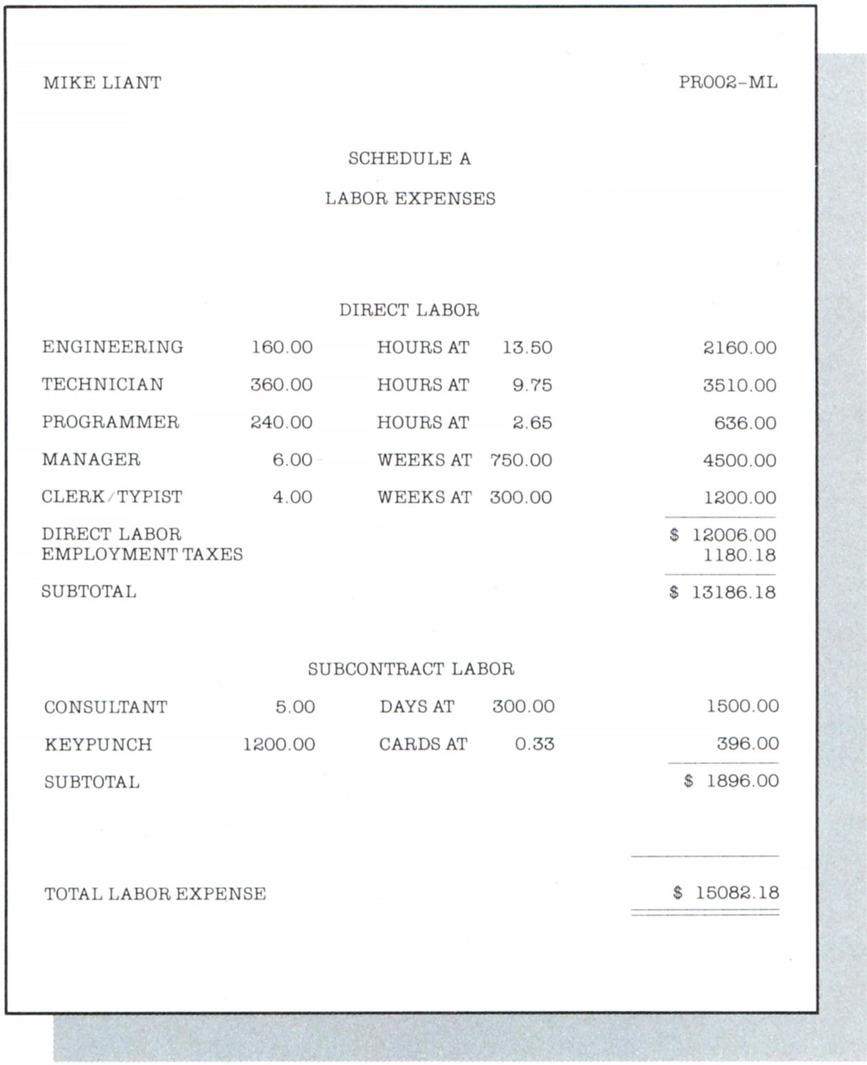
Note in the sample run that the routine allows the user to enter the category name for each labor grade, the appropriate pay computation period (hours, days, weeks, years) and the estimated rate per period. Again, the computer performs the needed multiplication and addition. At run time, the labor costs are detailed on the "Schedule A" printout and summarized on the proposal cover sheet.

Each of the categories for "Other Costs" permits up to 10 separate cost listings. Again, a minor programming alteration will increase the number of subcategories, and a carriage return response will shorten the prompting series at run time. The "Material" and "Other Direct Costs" categories mimic the labor input sequence. The user enters the name of the category, the measurement units (trips, pounds, bushels, etc.) and the cost per unit. The computer calculates the totals.

Since "Miscellaneous Costs" usually can't be estimated by a units-times-cost-per-unit method, the program asks for the type (name) of cost and the total amount. In most proposals the "Miscellaneous" category is the weakest during negotiations. It's a good idea to hold these entries down.

And since many of the "Other Costs" items may be subject to a sales tax, the routine asks for the sales tax percentage for each subcategory. The tax is calculated during the program run.

"Other Costs" are detailed on "Schedule B" of the printout and summarized on the proposal cover sheet.



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MIKE LIANT                                                    PR002-ML


                              SCHEDULE A

                            LABOR EXPENSES



                             DIRECT LABOR

ENGINEERING        160.00     HOURS AT    13.50              2160.00

TECHNICIAN         360.00     HOURS AT     9.75              3510.00

PROGRAMMER         240.00     HOURS AT     2.65               636.00

MANAGER              6.00     WEEKS AT   750.00              4500.00

CLERK/TYPIST         4.00     WEEKS AT   300.00              1200.00
                                                          -----------
DIRECT LABOR                                              $ 12006.00
EMPLOYMENT TAXES                                             1180.18
                                                          -----------
SUBTOTAL                                                  $ 13186.18


                           SUBCONTRACT LABOR

CONSULTANT           5.00     DAYS AT    300.00              1500.00

KEYPUNCH          1200.00     CARDS AT     0.33               396.00
                                                          -----------
SUBTOTAL                                                   $ 1896.00


                                                          -----------
TOTAL LABOR EXPENSE                                       $ 15082.18
                                                          ===========
```

Indirect costs, too

As a further bidding aid, Cost Proposal asks for indirect costs (General and Accounting, or "G&A"), any desired Contingency Reserve and Profit as a percentage of the total. The computer calculates an exact amount for each area as a percentage of the total cost of the project, and these numbers are displayed as "recommendations."

With the recommended amounts for G&A, Contingency Reserve and Profit, Cost Proposal has accomplished its task as a management tool. The program user or the client must make the final decision on amounts proposed for each of these fields. The sample run illustrates a management decision to round off the recommendations.

When all the data have been entered, the routine asks which output port the user wishes to use. On the SWTP system on which the program was prepared Port 1 is the control (video) terminal and Port 3 is the printer (TTY).

Often the client has a target figure in mind for the total contract. The estimate may turn out to be considerably above or below the target. Where this possibility exists, one handy approach is to print a hard copy of the first proposal effort as an "adjustment worksheet." The client can take the worksheet back to the office and adjust the estimate by category. The "red-lined" worksheet then becomes an input guide to prepare a final proposal for the client.

A final proposal can be prepared from such a worksheet in less than a half hour. And since clients are usually running against deadlines, that feature alone will repay you many times over for the effort spent developing Cost Proposal.

Line by line

A line-by-line "walk" through Cost Proposal will familiarize you with its features.

Lines 10 through 150 provide the header information. Lines 80 and 90 are formatting commands to the SWTP interpreter, to allow the program full control of the display and output. Lines 100 through 150 provide variable dimensioning, to restrict the allocation of program memory to that needed. If you elect to change the numbers of subcategories addressed later in the program, you'll need to adjust the dimensioning on the affected variables.

Client information and proposal identification information are collected by lines 200 through 250. The "Client Name" and "Our Proposal Number" variables are used in two places on the printout—on the cover sheet and at the top of each schedule.

The actual job of estimating is carried out in lines 1000 through 1950. REM statements (with a row of asterisks) mark the subcategories. Since each subcategory is similar, we can consider the first one, "Direct Labor Costs," in detail and just touch on the differences in others.

"Direct Labor Costs" are collected in lines 1000 through 1190. A

FOR...NEXT loop supervises the collection of cost information into the matrix variables L$(n,n) and L(n,n). The variable assignment is:

L$(X,1) = Name of Labor Category
L$(X,2) = Name of estimating units (hours, days, etc.)
L(X,1) = Number of units
L(X,2) = Cost per unit
L(X,3) = Total cost per category
L = Total cost of direct labor
Ll = Total Employer Taxes amount
T(l) = Employer Tax Rate

The GOSUB 8000 at line 1020 provides a general operator instruction message. Line 1030 initiates the FOR...NEXT loop, and it is the only line that need be changed to increase the number of direct labor categories. (Of course, you'll have to change the DIM then back in line 100 and the corresponding FOR X... in the print routine at line 3110.)

Collecting the pieces

Lines 1040 through 1120 collect the entries. Line 1060 is the statement that will end the category collection sequence when it senses a null category. Lines 1130 and 1140 provide the calculations to give total cost per category and a grand total for "Direct Labor Costs." The "Tax Rate" business is handled in 1170 and 1180.

The subcontract labor data collection routine is nearly identical to the direct-labor exercise. The variables are based on "S" instead of "L," and the sales tax rate is filed in variable T(2). To increase the number of subcontract labor categories, change the FOR X... statements in lines 1230 and 3270 and alter the DIM in line 110. The entire subcontract labor category collection is housed in lines 1200 through 1390.

"Material" (lines 1400 through 1590) and "Other Direct Costs" (lines 1600 through 1790) are also near-duplicates of direct labor. "Material" variables start with "M"; "Other Direct Cost" variables are "D." To increase the category size of either, change the statements in 1430 and 4100 (for Material) or 1630 and 4260 (for "Other Direct Cost") and alter the DIM statement in either line 120 (Material) or 130 ("Other Direct Cost").

Since miscellaneous costs are collected as lump sums, the collection routine of lines 1800 through 1950 is a little less rigorous. The variables C$(X) store the name of the category, and C(X) collects the total amounts. "C" is the miscellaneous grand total, while "Cl" and "T(5)" take care of sales tax. An increase in the number of collection lines requires changes in lines 1830 and 4420, as well as the DIM in 140.

Overhead factors

Statements 2000 through 2150 address the burdens, reserves and profit recommendations and selections. The percentages are stored in variables Gl (G&A), Rl (Reserves) and Pl (Profit), while the actual selections are kept in G, R and P.

The addition of these overhead factors is cumulative—that is, G&A is added to total direct cost before contingency reserves are calculated, and contingency reserves are added prior to the profit calculation. This treatment is consistent with normal practices.

The remainder of the program is devoted to the printing of the cost proposal. The schedules are printed first, then the cover sheet to allow the calculations to be handled as part of the printing routine.

Statements 3000 through 3480 take care of Schedule A, 4000 through 4600 print Schedule B, and 5000 through 5440 take care of the summary and cover sheet. The PRINT statements are all pretty straightforward. Some of the TAB functions deserve a word or two, however.

TAB(65-LEN(STR$(G))); provides a tabulation calculated to line up the decimal points of numeric variables. In this case, the TAB would space the printer so that the number stored in variable "G" would *end* in column 65.

TAB(INT((72-LEN(A$(1)))/2)); provides a centering tabulate. In this example, the character string variable A$(1) will be centered on a 72-column-wide paper.

If your BASIC has a different way to handle this printer formatting, you may save some keypunch time.

Rounding off dollars

Lines 5130 and 5170 in the print routine are good candidates for run-by-run alteration. As they stand in the printed listing, they round off the dollar amounts for "Labor" and "Other Costs" to the next even 10 dollars. You may wish to round off to the next 100 or not round off at all.

Lines 7000 through 9340 contain the subroutines called by the remainder of the program. The proposal header is kept in a subroutine because it is the most changed part of the printout. Frequently this header will become a five-line or six-line client letterhead; at other times it is a series of prints that allow room for a client's letterhead to be superimposed for photocopy reproduction.

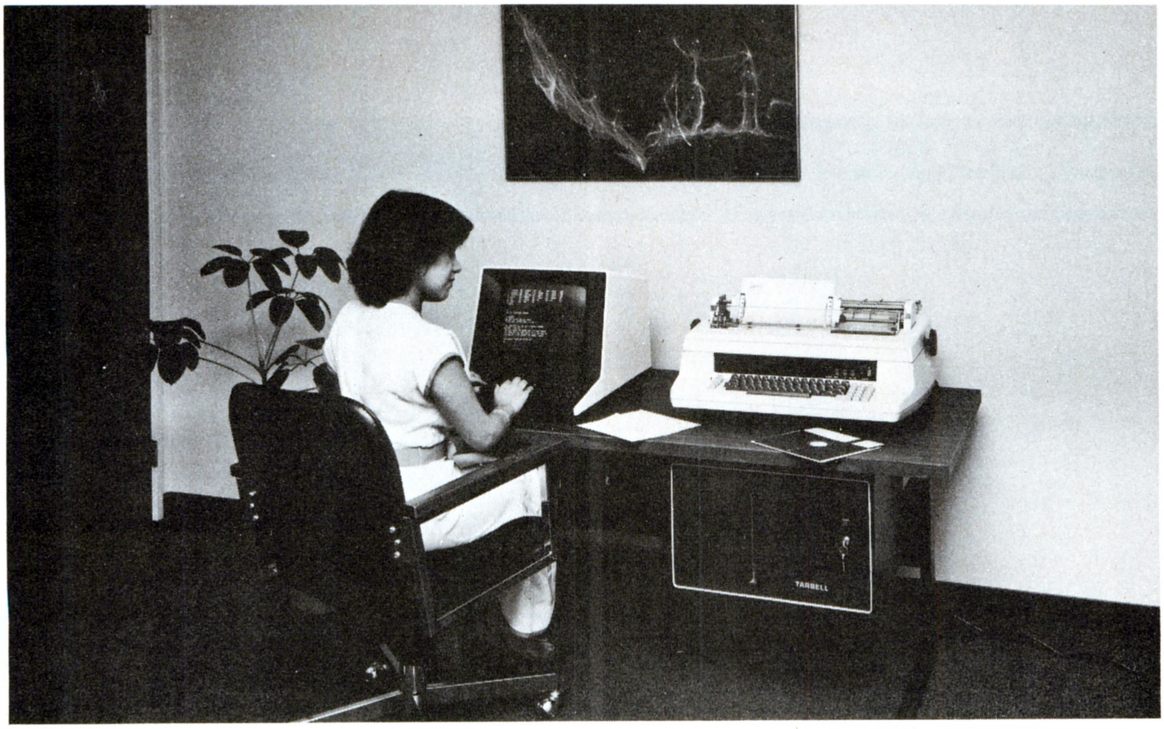
The "Entry" routine of 8000–8060 is a general operator prompt message.

"Another Copy" (lines 9100 through 9170) serves two purposes: it allows a video terminal review prior to hard-copy output, and it permits multiple copies.

Lines 9300–9340 let the operator pick the output port for each iteration of the print routine. You may wish to omit this and always vector your print messages to the same output device.

continued on page 143

Move Up to Tarbell



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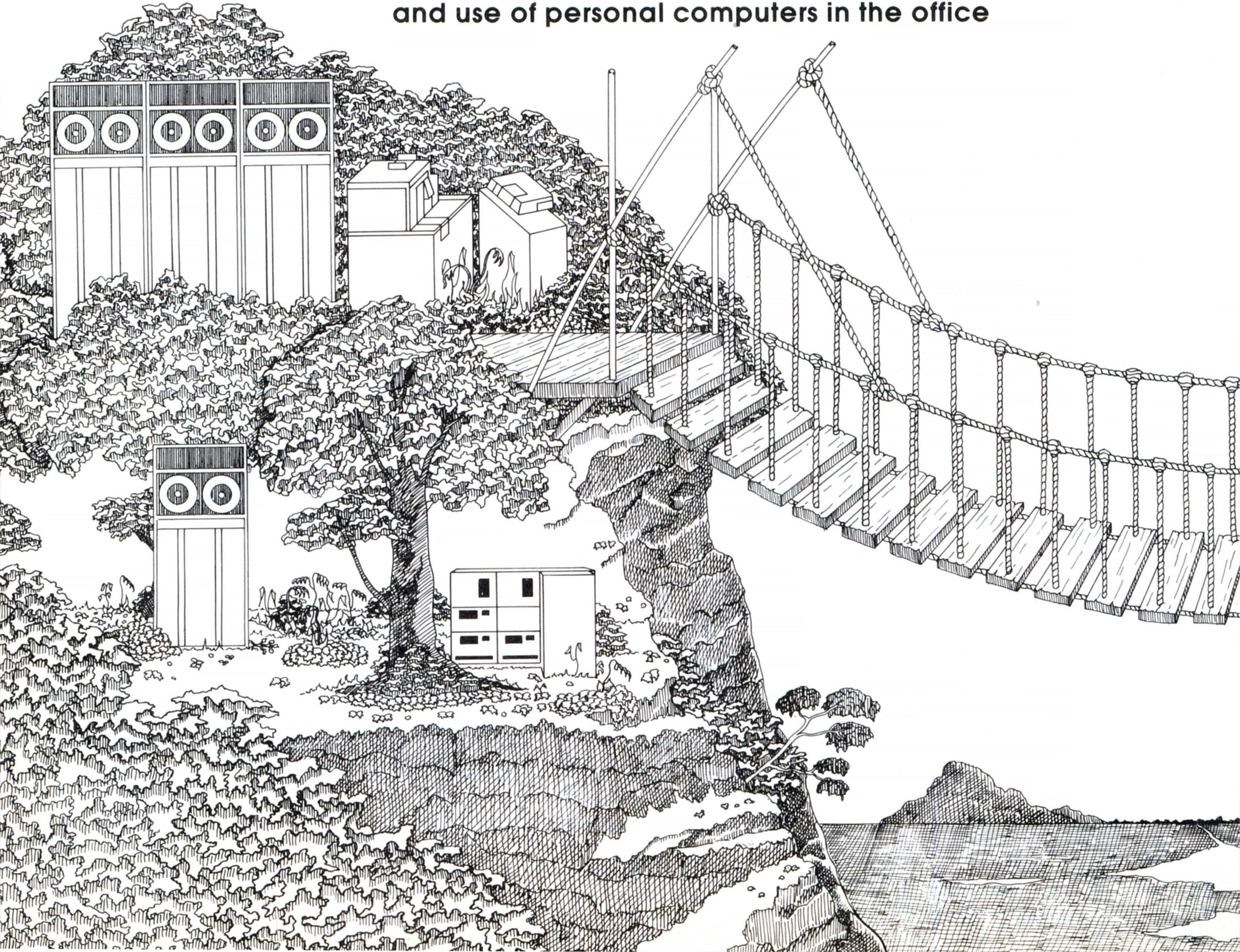
CIRCLE 19

Personal Computers in Business—The View from the Data-Processing Shop

DP managers give advice on the purchase and use of personal computers in the office



By Ken McLamb

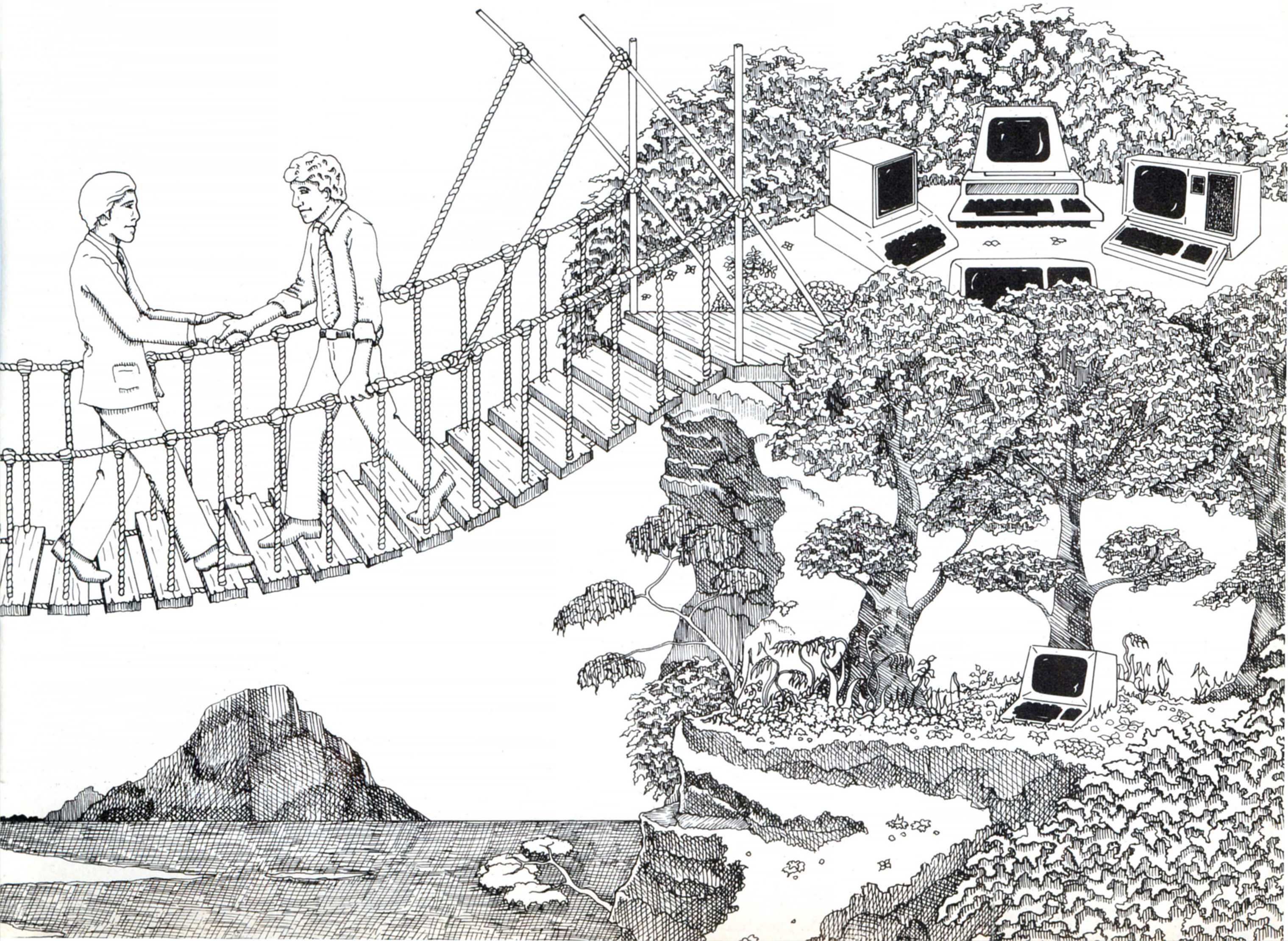
It's estimated that at least 750,000 business people are using personal computers, a good many to help run their businesses, and one thing is certain: the total is growing. You are the owner of a small business. Should you join this trend?

Perhaps you are one of the myriad business owners who know that manual systems no longer suffice at work. What jobs in the business can the personal computer do more efficiently?

Will your employees object to the new system?

A cross section of corporate data-processing managers who have faced questions like these in a big business environment offers this basic advice:

- First, be sure you really are ready and are computerizing for calculated, pragmatic gains rather than for merely keeping up with Jones & Co.
- Define the applications in your business that would benefit from computerization and those that would be just as well left to existing procedures.
- Solicit the opinions of well-informed colleagues and professionals on which of the many options for hardware and software are right for your applications.
- Choose only suppliers with top reputations, particularly for in-use servicing, and don't hesitate to check references.
- Be aware that at least some of your employees will feel threatened by the machine and will resent the change in work routine—unless you consult with them from the beginning and make it clear that the aim is to make everyone's job more pleasant and productive.
- Expect to spend more time and



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- The current balance sheet on small business software.
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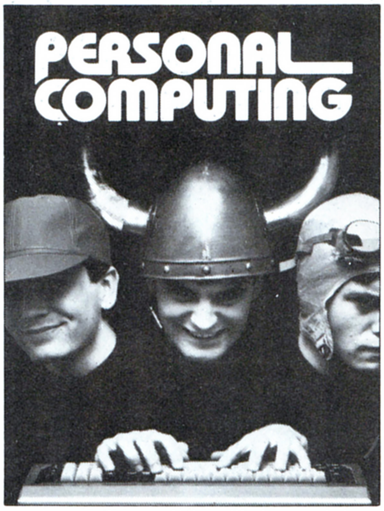

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money than you estimate to get the system to work the way you want it to.

- Remember that at each step of the way, it's easy to make a mistake that may be costly or impossible to correct.

One thing on which all of the experts who were interviewed agreed: **If you do it right, you'll be glad you did. Your company—any company—will then conduct certain vital operations with greater capacity, speed and accuracy than ever before.**

But, the dp managers cautioned, to do it right takes planning. Every phonograph you buy will play a record more or less well, but if you get the wrong computer configuration for the goals you set, it won't play.

Avoid emotionalism

"I've seen it time and time again," said J. B. McLaughlin, research and development vice president and head of data services for Bergen-Brunswig, distributor of pharmaceuticals and health-care products in Carson, CA "Businessmen will try to justify a computer because they want one. They make an emotional decision, instead of a good business decision, without a clear-cut idea of how a small computer will improve their operations. Then they get disenchanted, especially with the expense of constantly patching up the situation, and they blame the computer when it's their own fault for making the wrong choice to start with.

"Finally they'll try to peddle it for whatever it will bring, and they're left with a bad taste and no automated data. If they had taken a careful approach at the beginning, their business could have grown with the help of a reliable servant."

Expect frustration

Janet Langer, of the Government Avionics Div. of Rockwell International in Cedar Rapids, IA, believes businesses often acquire computers with "way too high an expectation level."

"You shouldn't expect miracles," she said. "Some disappointment and frustration are inevitable at the beginning, and I think you should double your first estimate of the time and money it will take to reach your goals."

On the other hand, Langer advises against being overly timid. "There's no reason to be afraid of it," she said, "if you want it and need it and you take the time to figure out the impact, in addition to being sure it meets your unique demands for cost-effectiveness. Every company has to automate some parts of itself sooner or later to stay competitive. Any form of automation will save money, too, if it is well-managed and not misdirected."

Where to computerize

You are now unemotional, practical-minded and prepared to accept the worst about a personal computer, and you wonder where in your business the new system will be most helpful.

"What is it that worries you most about your business when you go home at night?" asks Bergen-Brunswig's McLaughlin. "Put that first on the agenda for automation, and the next priorities will fall into place."

"Where is the greatest profit leverage in your company?" asks Bruce Wilson, national products technology manager for a division of the Boeing Computer Services Co. in Seattle.

When a friend asked Wilson some months ago how best to automate data for three restaurants that he owned, the two quickly concluded that the profit leverage lay mainly in cost management of materials—the purchased food and drink that typically accounted for 35 percent of the menu price but could change abruptly with wholesale fluctuations. The first thing to go into the computer, Wilson told his friend, should be inventory and materials cost data, along with models for adjusting menu offerings and/or prices within the constraints of customer acceptance.

Wilson also recommended in this case general-ledger software and an adjustment of cash registers to generate data in a format that would be easily digestible by the computer system, although not necessarily plugged into it. Overall, Wilson said, the restaurateur's goal should be to "pick up all the little grains of sand in cost management."

Try a flow chart

Before a business of any kind chooses a system, Wilson strongly advises planning the flow of data through discrete stages: "Where will the data come from—sales slips or whatever—what do you do with it then, what data controls will apply across each major processing step? Think it through. Too many business owners have started off in the middle, getting a system and then trying to figure out a sequence of steps and controls."

W. E. Thompson, dp manager of Dura-Bernerdin, an Evansville, IN, manufacturer of closures for commercial and home canning, believes that accounting records and inventory control, in that order, are the two strongest candidates for computerization.

Langer recommends that a small-business manager first "automate his sales person's life and get fundamental order control," particularly if the current system falls somewhere in the nebulous zone between manual and mental labor.

Payroll administration is another function that the computer may be able to handle more efficiently. And the possibility of using the computer for inexpensive word processing is near the top of applications that almost any business will find desirable. Big companies are used to paying more for dedicated word-processing machines than a small company might pay for a versatile personal computer with a word-processing software option.

"The breakdown depends entirely on your line of business," noted David Rafferty, manager of the Scientific Computer Center for Raytheon in Bedford, MA. "You can say any company is better off with automated inventory control, but then again what's the point if you're in the sand and gravel business and all you have to do is look out the back window and see how big the pile is?"

Data processing at Raytheon provides some interesting glimpses at how wide the uses of personal computers can be. Raytheon has as much expensive and supersophisticated computing capacity as one would expect in a top Space Age company. But many a desktop at Raytheon has a personal computer, purchased either by the company or by the employee.

"I like them," Rafferty said of the small machines. "People should have them." He said he asked only that employees standardize on choices so there would not be many systems with incompatible enhancements.

TRS-80s and Apples are mostly in view at Raytheon, and they are sometimes used to access remote data bases. More often they are used by work sections or individuals precisely because they can do intelligent things without being hooked to a network. Some employee groups use them for internal accounting and budget control; word processing is popular, especially an electronic mail subset.

"Project managers can keep track of their schedules," Rafferty said. "If you have 10 projects going at the same time, you can find out quickly whether Charlie's on time or he's holding up the show. The personal computers make it easy for an individual to do various types of 'what-if' exercises. That would be difficult on a large system, and we avoid the risk that people who aren't too experienced with the large system will damage the data."

Share the decision

You are convinced a personal computer system will help run your business more efficiently. Which employees in a small company should have a role in the purchase decision? Ernie Venta, who heads a new Micro-Age store in Milwaukee after managing data systems and programming for one of J. C. Pen-

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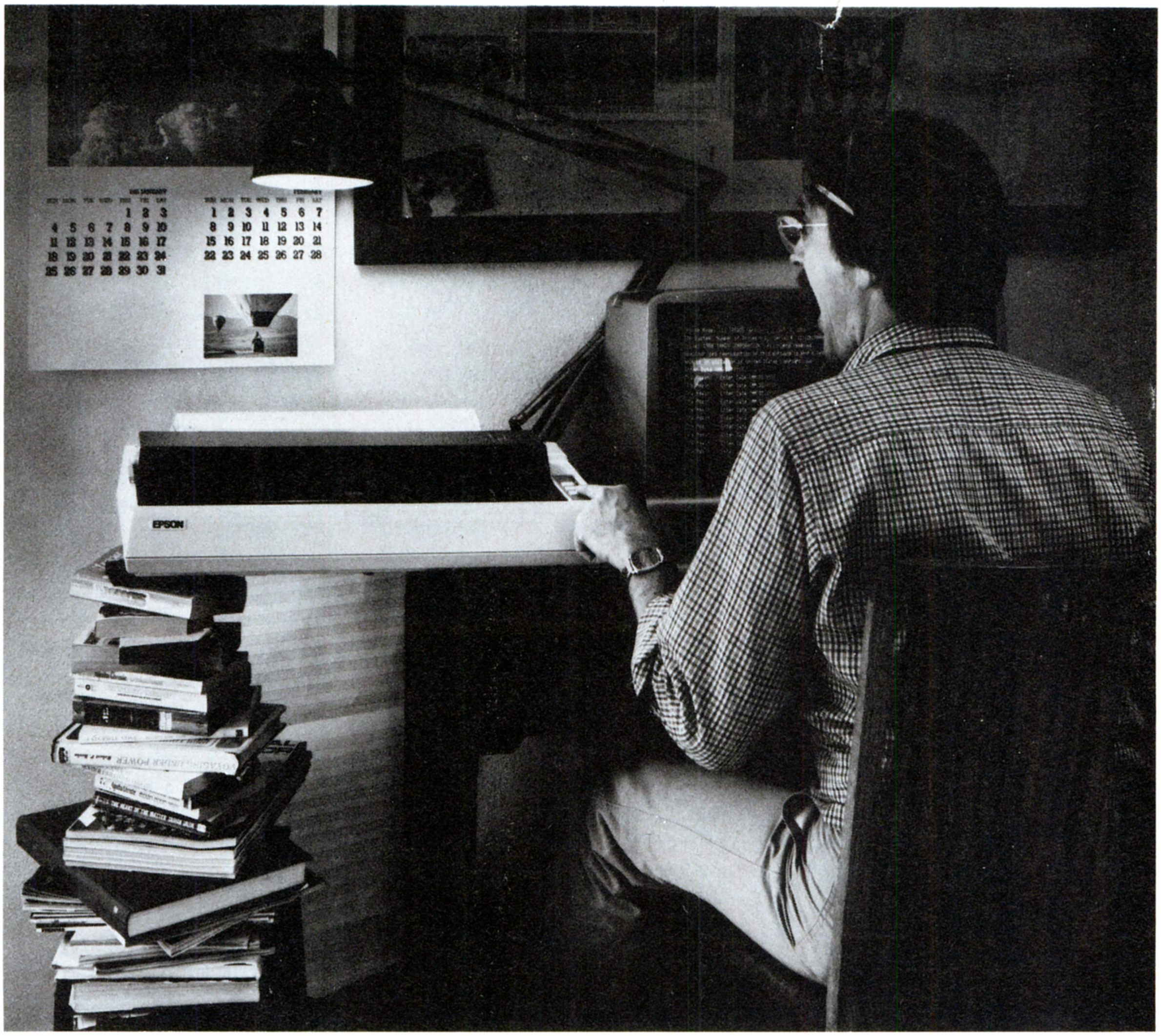
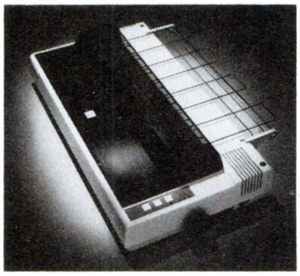
CIRCLE 20





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CIRCLE 21

ney's four regional systems departments, recommends three levels of staff and management involvement: The person who will be responsible for the daily operation of the system, the one who will be the key user and disseminator of the generated information, and the boss who will authorize payment for the computer.

"All should be comfortable with software as well as hardware," Venta said. "A bad experience at any of the three levels can undermine the operation."

All of the experts agree that it's important to inform the rest of the staff members and get them involved fast once the decision is made. Perhaps no other change introduced in a company will affect patterns of work and interpersonal relationships as much as the introduction of an automatic data-processing system—even a small and not overly conspicuous computer sitting on a desktop.

"People don't like change, especially in their jobs," observed Vicki McConnell, head of the McConnell Group of consultants in Los Angeles. "You have to market a computer system psychologically to people in the office. Begin a dialogue with them and let them unload anxiety, assure them the computer will take some repetitive work off their hands and allow them to work more creatively.

"If you don't sell the idea well in advance, the rumor mill will start up, and there will be fear and suspicion about losing jobs and having to live with a foreigner in the office who uses a funny language.

"When employees are prepared psychologically and given the knowledge and skills to deal with changes in the work routine, they'll feel they're part of an improved process and they'll say, 'Hey, this ain't so bad.' The moral is don't impose technology. Introduce it."

Picking the system

The choice of efficient personal computer systems is ample. The options for original-equipment hardware are the easiest to narrow down, in the view of the dp experts. The main criterion here is the ability to expand the machine with peripherals and power when needed—to accommodate the software you eventually get. It's quite logical to put the cart—the payload for your specific programming needs—ahead of the hardware horse that will pull the system.

Edward White, who operates a Computerland franchise in Allentown, PA, says he often encounters customers who are set on the wrong type of business computer for their needs, or who ask "What's available?" when they don't need one at all. White doesn't mind advising them. He is a registered consulting engineer and president of Computrol Engineering Inc., a former corporate dp manager for several years and a designer of logic systems for Burroughs.

He tells anyone just starting a small company to wait at least a year and return when the "overtones" of the new venture are securely established.

Consider software

"If the business is mature enough," White said, "the best start is to go over the software possibilities for general ledger and payroll and some other primary functions. The personal computers are excellent for these. They can be expanded to outperform minicomputers. I don't believe there's a clear-cut distinction between minis and micros any longer, the minis have come down so much in price and the micros have come up so much in performance.

Personal computers are also excellent for financial planning and modeling," White continued. "One company I know of," he recalled, "compressed six months of marketing planning into two days with a VisiCalc program set up on an Apple II Plus. That might be an extreme example, but when a company does buy the best system for its requirements, the payback will often take less than a year."

As for hardware, White believes "all the popular machines are basically good and every machine in the market has its niche—except some junk, which is easy to avoid if you ask around at all."

White is far from alone in his admiration for VisiCalc. Compatible with several of the leading personal computers, it has become one of the world's most widely used software packages.

Virtues of VisiCalc

VisiCalc's applications are wide enough to cover much of the range of small business planning and projection requirements, and it's interactive—exchanging registered data with other programs devised by the same vendor—to extend its versatility without duplicated effort. It is keyed without artificial language, enabling a beginner to start producing results.

McLaughlin at Bergen-Brunswig suggests that a small company "start simple" with word-processing software and VisiCalc. "If you've ever dealt with spread sheets, you'll love it," McLaughlin said. "When you make one mistake that affects four subtotals, it'll do automatic recalculations of fields. The package pays back the first time you ever use it seriously."

Otherwise McLaughlin is less than happy with canned programs. He has found many to be "mislabeled"—inadequate for the stated purpose, containing errors and improperly documented. Anyone who tries for a bargain in the software field, he

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CIRCLE 21

says, will get less than he paid for.

"You can generally trust the big names," he noted. "We've had a good relationship with Racet, which has quite a few real professionals and is well run. They get back to you quickly, and problems and questions are usually resolved in a day. For most software suppliers, you should ask for a reference list."

Consider training

Wilson of Boeing Computer Services says that the degree and quality of training offered with the computer package should be a main consideration in choice of vendor. "You shouldn't try to cut corners on training to save money," he said. "If it costs a hundred dollars a day for a week to go to classes, consider it a good investment."

Few generalizations can be made about the total cost of acquiring the computer system that will be optimal to every small company. Suffice to say that a good personal computer is one of modern technology's bargains. Hardware peripherals will add moderately or greatly to the price, depending on demands for speed and sophistication. Software cost is up to you—not expensive if the available canned packages are acceptable, but progressively more expensive as you customize.

Even the simplest computer system intended for home use can have modest business application for only a few hundred dollars. The most powerful systems, with a generous complement of add-ons, might run close to $50,000, which traditionally has drawn the line between the personal microcomputer and the mini.

For the practical purposes of most small businesses, McLaughlin estimates $4000 for the hardware on a shoestring budget and $6000 to $10,000 for an outfit that operates faster with some more capacity, perhaps including the advantage of a hard disk and a bidirectional printer performing at 100 characters or more per second.

With so many variables to consider, the question of whether to retain a computer consultant arises. The dp professionals disagree. Wilson said yes, see a consultant—"it's a heck of a lot easier than any other route." Others were lukewarm.

Some considerations: Consultants' fees, which are routinely paid in the big-computer market, are high in proportion to outlay for a personal computer system. And the buyer must beware. The consultants' field has a good many practitioners who are simply "between jobs" or otherwise underqualified; most of the real pros are dedicating their brainpower to big organizations that need big computer power.

If you can possibly afford the time, read about modern data processing, take a course in it, talk to people who are knowledgeable about it. This could have a permanent value far beyond the preparation for a shopping expedition.

Once You've Bought It, You Have to Run It

Buying a small computer for a business is one thing. But then the question remains, "How is one to use the machine once it's in the shop?" There are lessons that the data-processing managers have learned over time that smooth operation of a computer.

Jim McLaughlin, vice president of research and development for Bergen Brunswig, addresses some of these lessons in the following interview.

PC: What can a data-processing manager tell small-business men to help them use personal computers better?

Mc: Probably the most important area of all is backup. Most of the people I have seen who are dealing with computers for the first time just don't understand the importance of backup. I've seen months and weeks go into a system, only to have it all wasted by a sick diskette that no longer can be read. Often, if the person had a backup at all, it too was bad, because somewhere along the line, the user backed up a bad diskette. So I tell people that backup is terribly important, and backing up after the last diskette isn't necessarily the way to go either. Typically, a user should have a system that will allow him to get back to where he was a month in the past.

PC: It's been suggested that a businessman could buy an Apple, say, with a cassette recorder, and then as his needs expand, he could buy a floppy disk drive and use the cassette drive for backup. Is that a feasible approach?

Mc: Yes, it's practical in cases where the system can support both types of peripheral. Practical, that is, in that a cassette isn't that bad a backup medium. But a person planning this approach should realize that cassettes are slow, and that it will take a long time to backup a disk field. But there are new programs coming along that allow one to place the contents of an entire disk file on a cassette. And if he does that, he knows that that diskette has good data that he can go back to.

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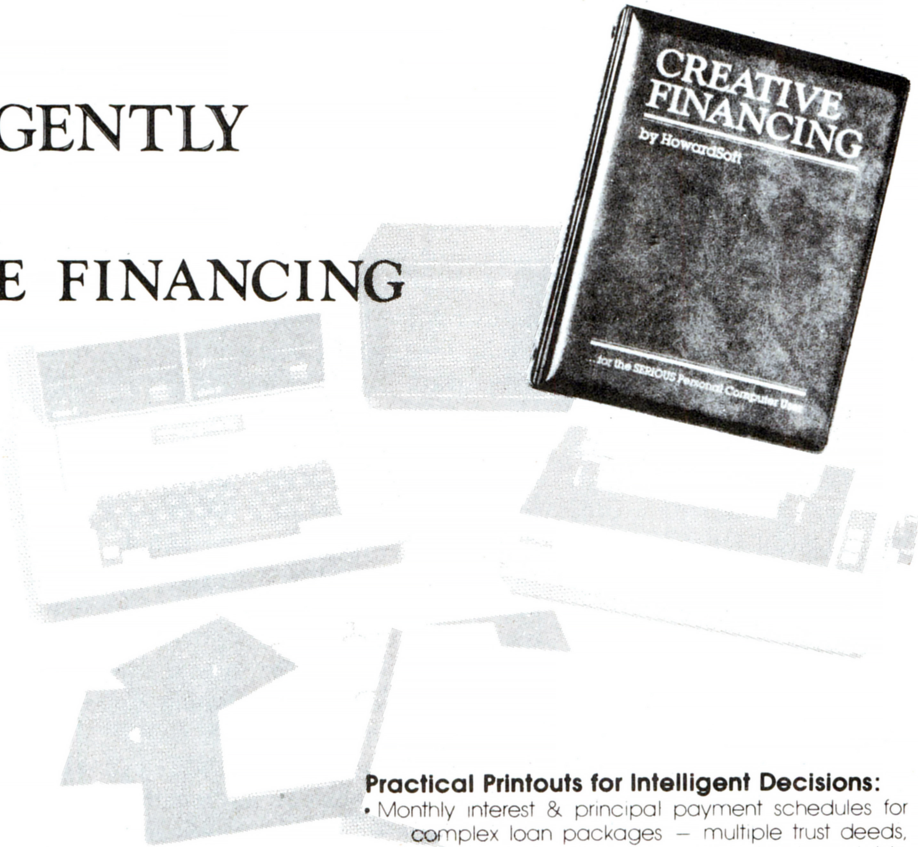

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CIRCLE 29

PC: Is time, then, a real consideration?

Mc: It sure is. One thing people should be aware of is that there's a trade-off between the time it would take to recreate the file—data or program or whatever—and the time it takes to do the backing up. If the actual process of backing up takes longer, as it would for, say, a 20 line program, then a person is better off using paper and pencil for a listing and forgetting about going through the motions of backing up the program files. One can get so involved with backup that he spends more time backing up than he does processing.

PC: What about new products coming on the market for backup, like streaming tape drives?

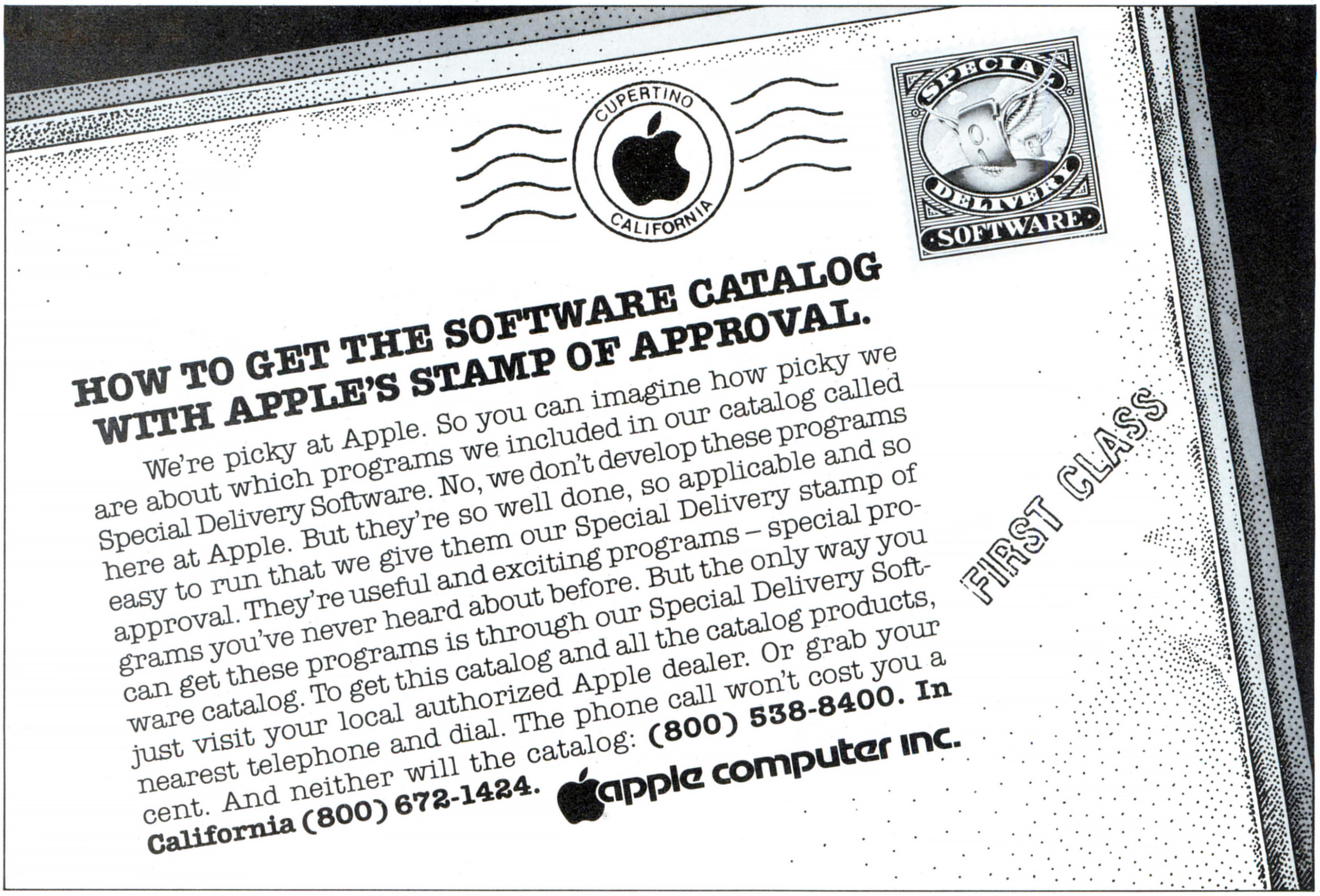
Mc: Streaming tape, which essentially reads and copies a disk file non-stop, is something I'm not terribly impressed with for the personal computer. First of all, I doubt that someone using a personal computer has a need for all that speed. Second, there's the fact that the drives have no read-after-write capability. So the user doesn't know if the data that are on the tape are correct.

PC: Let's leave the backup question and move on. Do small-businessmen need to have an operator?

Mc: Here we're getting into a touchy area. I think, and this is my personal opinion, that personal computers don't need operators. I know that some people have so many thumbs, so to speak, that no matter how simple the system is, they will have trouble operating it. But they are the exception. If a system has been written with well-designed human-engineering factors, then anyone should be capable.

PC: You know the things that small-business owners say to rationalize not becomining the operator of the system themselves. Can you give a short list of them, and how they're wrong, if they are?

Mc: One of them I alluded to before. "This is technical stuff, and I can't get involved." And my answer is very simple. The day of the non-tech manager is over. It has been over for several years. The second most prevalent reason is, "My time would be much better spent in other areas." That can be true. I don't think the business owner should be the one running the word-processing system. But if he's going to be running report controls for his company there's a possibility of planning and what have you. To whom else is he to assign that?



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CIRCLE 24

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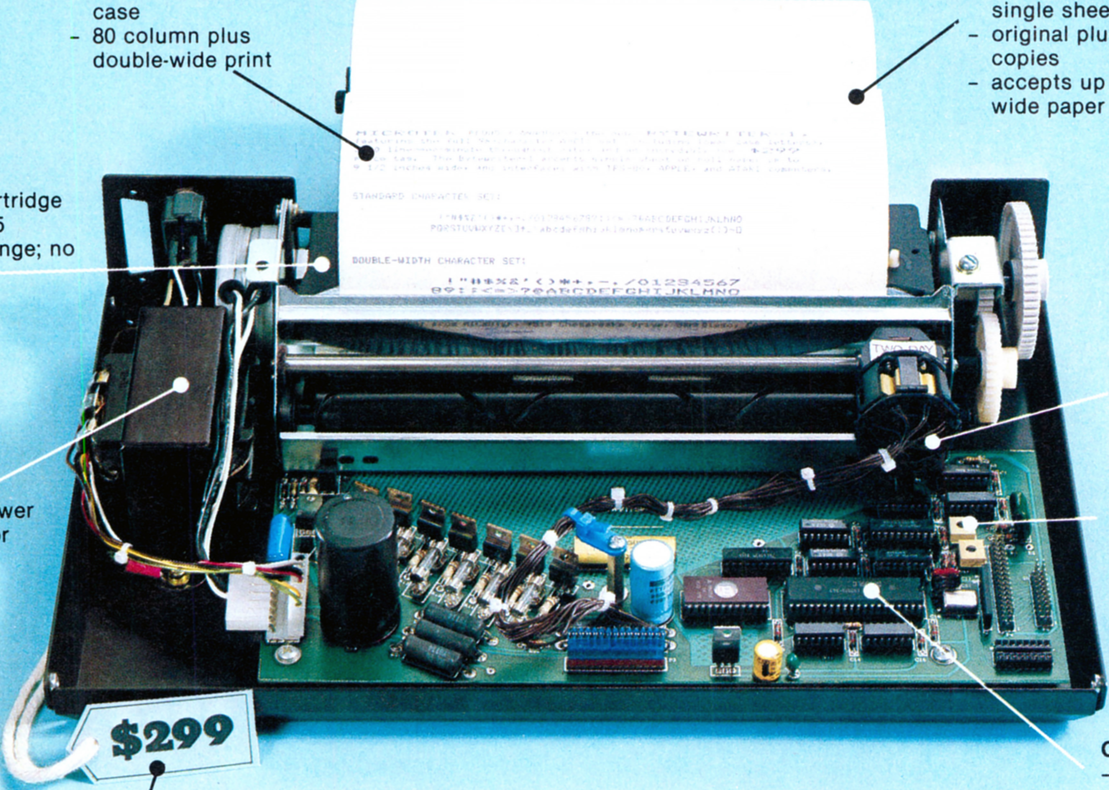

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CIRCLE 25

EDUCATIONAL COMPUTING

Lee The

"What Did You Do in Computer Class?"

An activist parent's guide to getting computers into the schools

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Computer literacy is the next great crisis in education," states Andrew Molnar of the National Science Foundation.

But how could that be? Aren't we in the chips? Articles appear everywhere about hundreds of school districts—from Lamplighter in Dallas to Menlo Park, California to the legendary Minnesota Educational Computer Consortium to La Grange, Illinois—all dedicated to 100 percent computer literacy in their bailiwicks. Can't a parent just relax and let the local district propel his or her child into the limitless future?

Think again. America could be backsliding in all forms of technical education. Here are some facts Molnar presented at a recent talk in Arizona: "A study conducted at the math department of the University of Chicago concludes that the Soviet population is getting an education that only a very few of our best students are receiving. In the Soviet Union, 97 percent graduate from secondary school compared to 75 percent in the United States. The Soviet citizen gets 13 years of education compared to 12 in the United States. All Soviet secondary school graduates will have two years of calculus as opposed to 105,000 students in the United States who receive one year of calculus. The Soviet student's science curriculum is also very intensive, including five years of physics, four years of geography and one year of astronomy. But in the United States only 9.1 percent of our students graduate with one year of physics, 16 percent with one year of chemistry, 45 percent with one year of biology and 17 percent with one year of general science. . .The Soviet Union is making an intensive effort to educate its entire population in science and technology."

The Soviets aren't the only ones, either. Molnar adds, "Last October, France's President Valery Giscard d'Estaing declared a special week for 'Computers in Society' to emphasize the importance of computers in the French economy. The French are installing 10,000 microcomputers in their high schools throughout the country as part of their 10-year plan to make their country high in computer literacy."

Even where we have placed computers in American schools, usage patterns often don't spread beyond utilization by a small elite group. For this reason, E.W. Carr of Denver, CO, is almost against computers in the schools. What's surprising about this is that he's the chief executive officer of Dakin5 Corporation, a major American software firm. Carr paints this computer implementation doomsday scenario: Someone—the principal, perhaps—presents our typical school with a computer, and asks if anyone would like to take charge of it. "Sure, you bet!" say the math and physics teachers simultaneously. The computer gets installed in one of their classrooms. Now

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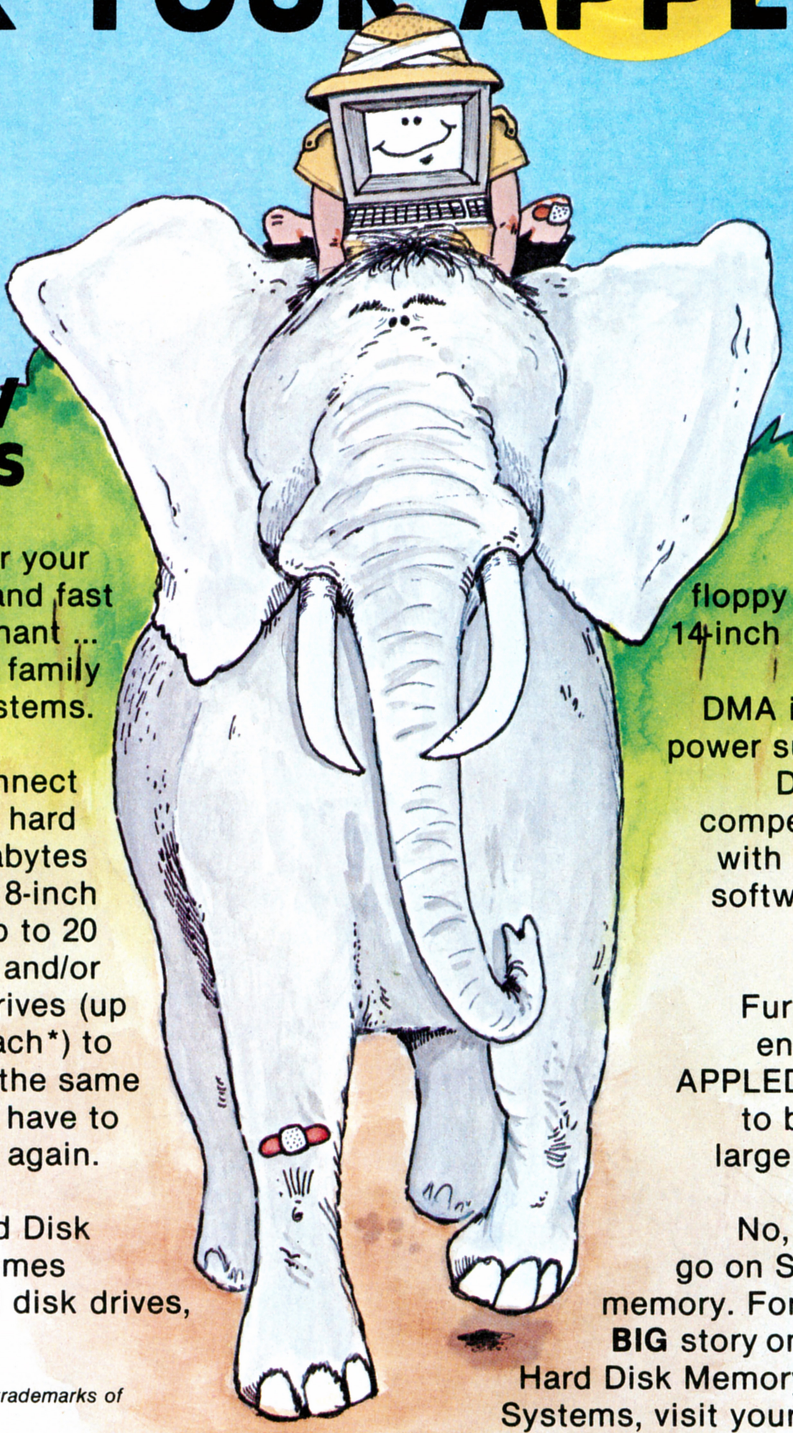

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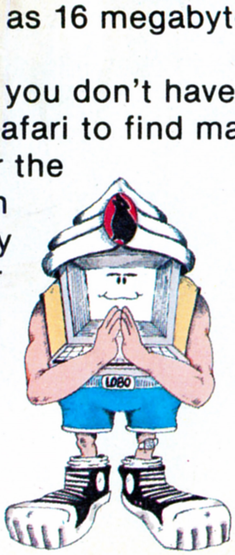

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CIRCLE 26

there are bound to be a few students in any high school who are destined to become programmers. They attach themselves to the machine as tight as limpets in heavy surf, fending off all attempts at access by lesser lights. And why not? After all, they are going to be programmers. Anyone else is just playing.

Thus, in Carr's scenario, the computer soon vanishes from the sight of the rest of the students. Sometimes literally—the programmers move it into the space between classrooms where the teachers have their offices and lab equipment.That way the hooligans (and "normal" students) won't have a chance to damage the valuable equipment. Carr believes this may even set back general computer literacy: The rest of the students are given the impression that they are and will forevermore be computer-incompetent.

Cocktails for Computers

This grim picture finds reinforcement from another unlikely source. Jim McLaughlin manages data-processing activities for Bergen Brunswig Corporation in Carson, CA. A brilliant advocate of computer literacy, McLaughlin's been in the field since he studied for his college classes inside the vacuum-tubed Univac whose maintenance was his domain. He voices the dismay so many Americans feel about the schools: "How to get computers in the schools? That is the real question. . . in an affluent neighborhood the PTA will have two social dinner-dances and buy 17 computers the next week. [But in most school districts] they go with a bill or referendum and try to raise the money by explaining why it's going to enhance the quality of education. We're going to be hard pressed to do it for a while because there isn't enough good software out there to make it worth the while.

"Although they spend lots of money on 'flash-card-type' things which can be done on the computer as well as on other devices. . . they're going to have to show that the result of doing it is educationally enhancing to the student.

"Unfortunately, with the tenor of what's going on in the world today, the people don't feel good about what's going on in schools. . . people feel grade schools and high schools aren't worth a damn. They're turning out a generation of virtual illiterates. So they say [to the schools] you want more money? You're going to go out on strike to get more money? You want more money to buy things?

"The people are probably going to wind up fighting it."

Oh, to be elite

It comes down to this: While hundreds of school districts have computers, the odds favor a person being in one of the thousands that do not—or, at best, a person may live in a district where a privileged elite have access to the exclusion of everyone else. Given this, a parent can do what Jim McLaughlin did with his four children—educate them at home.

But there are reasons to keep trying—even singlehandedly—to get computers into *your* schools. In practical terms, you may have neither the financial nor the experiential resources of a computer expert. Carl Woodruff, a chief petty officer of the United States Navy, became a computer professional by self-study. He gives four reasons why a student should have computer education:

- "Don't look like a fool." The exponential proliferation of computers in our society mandates comfortable familiarity for everyone from bulldozer operators to ballet dancers—everyone, that is, who expects to practice his trade 10 years from now.
- "Principles of operation." Even a store clerk will be a better-paid store clerk with a course in the overall workings of computers under his belt.
- "Decision making logic." Computers teach logic better than any non-interactive system like a textbook, and teach it in ways that often closely simulate the decision-making processes of managers.
- "Computer-aided management." Computer competence (not necessarily programming—just user-competence) may one day become a prerequisite for anyone's move into management. Those who do move into management will understand what Oliver Wendell Holmes, Jr., meant when he said, "Life is action and passion; therefore, it is required of a man that he should share the passion and action of his time at peril of being judged not to have lived."

And this can be done quietly. Take Karen Groseclose of Phoenix, AZ. Director of Systems Interface, Inc., a data-processing consulting firm, Groseclose got computers into her children's school by doing volunteer work. She put the school's soccer club mailing list on her home computer. She uses a database management program for the soccer and baseball team. The PTA newsletter goes out via her word processing program. Thus the Madison, AZ school district is being drawn into computer literacy.

Groseclose's children use a computer in their Mentally Gifted Minor (MGM) class. She reports that rather than her children being forced into premature maturity, the computer lets them play low-pressure games that encourage development. And the kids come up with the most incredible uses, too. One child did an independent study of Greek mythology, reprogramming a game of Hangman into a class lesson on ancient gods and goddesses. Her work with children and computers has made Groseclose believe computers belong in all the classes, not just MGM.

Grassroots movement

Bobby Goodson, the subject and author of many articles on computers in education, teaches in Cupertino, CA. She is also a leading light in one of the most important resources for both parents and teachers—Computer Using Educators (CUE), an international organization devoted to the grassroots of getting computers into the schools. Goodson knows how to convince parents and teachers that computers in the schools are worth the trouble and expense. Most importantly, she wants to help people do it.

"Our primary—if not only—limitation is the software. I've got a whole new soapbox in that I want to see my teachers developing the software that we can get programmers and marketing people to perfect. Teachers in the classroom know what they want, and with a little bit of help they can design the programs that are needed."

Jim McLaughlin further substantiates Goodson's view: "The software is the most critical thing in the lower grades."

Goodson adds, "When anybody comes to me and says we've got new software, I'll say fine. When will you come demonstrate it? I'll set it up and anyone who's interested comes. They're learning a tremendous amount about software evaluation. In fact it's been embarrassing when a couple of software companies have come and the teachers have not hesitated to tell them what was wrong with it! We're reaching a point where unless we become critical we won't get good software."

But what about giving parents in other districts conversational ammunition?

"We have computers in 3/4 of our schools and not one of them was purchased with general district funds. It shows you that it is possible for individual schools and individual people to get this going."

Goodson has some vocational ammunition, too: "If a youngster graduates from high school with no particular skills and goes to either PG&E (Pacific Gas & Electric, the local utility) or Pacific Telephone—and if on the application he can claim 10 hours' experience at a computer terminal—and that's not much—it qualifies for preferential positioning on the hiring scale."

Art Leuhrman, former head of the computer program at Lawrence Hall of Science in Berkeley, CA, has stated that minimal programming skills—nothing fancy—translates into $1000 per year more in starting salary for a youngster going into almost any kind of job. Two 40-minute classes a week for a semester would probably more than do it.

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CIRCLE 27

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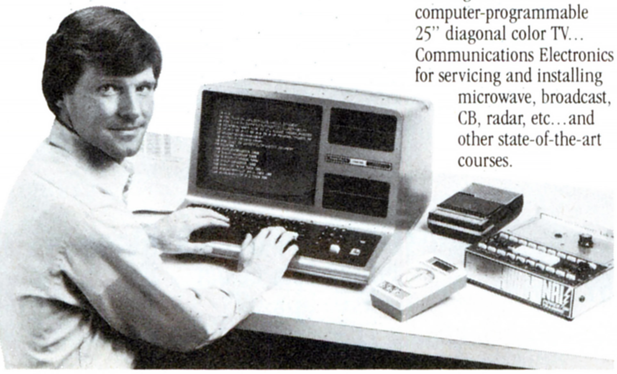

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Concerned parents

What can concerned parents do to get computers into the schools and thereby increase the chances of their children's success?

According to Goodson, "Part of the success of our program compared to others is that it has come from enthusiastic parents and teachers. It has not come from administrators handing them something. That is, I think, vital. When the superintendent or the principal comes in and says, 'Look what I have for you!,' the teacher says, 'I have enough to do—forget it.'

"But when you've got the parents and the teachers saying 'I want computing for the children and I'm going to find a way to get it'—and they go ahead and get it—it's going to be used."

Ken Brumbaugh, of the Minnesota Educational Computing Consortium, stated to Goodson at last fall's CUE conference: "You know, with all we've done in Minnesota we could not do what you've done here. And we will never even see a program like the one you've got here. We did it at a state level. That's nice, but here it has come from the teachers and the parents. And the enthusiasm and the excitement that you have in this area as a result is just something we will never get."

To Goodson, parental excitement is the key: "Hopefully if there's a parent who's excited, his child has a teacher who is open to it. One parent—who now works in the school—actually got started four years ago because she took her own computer into her second grade daughter's class for show and tell. And oh, everybody thought it was neat! The kids had fun and wanted her to bring it back next week. She did, and pretty soon the teacher in the next room said that sounded pretty interesting...could you bring it in my class too? And she wound up taking her computer over there several times a week."

Goodson agrees with Dakin5's Carr on the importance of his cautionary tale, as well. She believes if you only get the funding to install one computer, where it goes will determine whether you develop a program or not: "First of all you never start it out in a math class. In fact I'm a math teacher, and people ask 'What have you done with it in math?' I'm embarrassed to say we've probably done less with it in math than anything else. That's one of the big pluses in starting it in the K-6 schools—it does not become subject oriented.

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CIRCLE 28

COURTESY OF APPLE COMPUTER INC.

And I've spent a lot more time trying to involve English and social studies teachers. The math and the science teachers are going to figure it out anyway.

Financing

Getting monies from the state and federal governments can be tricky. The King of Siam observes in one song from *The King and I*, "Should I join with other nations in alliance? If allies are weak am I not best alone? If allies are strong with power to protect me—might they not protect me out of all I own?" Receiving government funding can offer similar Hobbesian choices. Goodson observes, however: "One thing is let's get them [the computers] any way we can. I'm finding that once they're here they're being used in other ways. This year I want to work with our special education teachers and see about getting some computers directly into our special ed classes. But I think that's a very specific use, along with Title I—there are probably 100 percent use needs there. Other than that, no matter how they were funded I haven't seen them getting too channeled.

"Even if they were purchased for the school with MGM money they find ways around it.They teach the MGM kids how to handle them, then the MGM kids become the tutors for the other students. Teachers immediately sense the universal use and need for them.

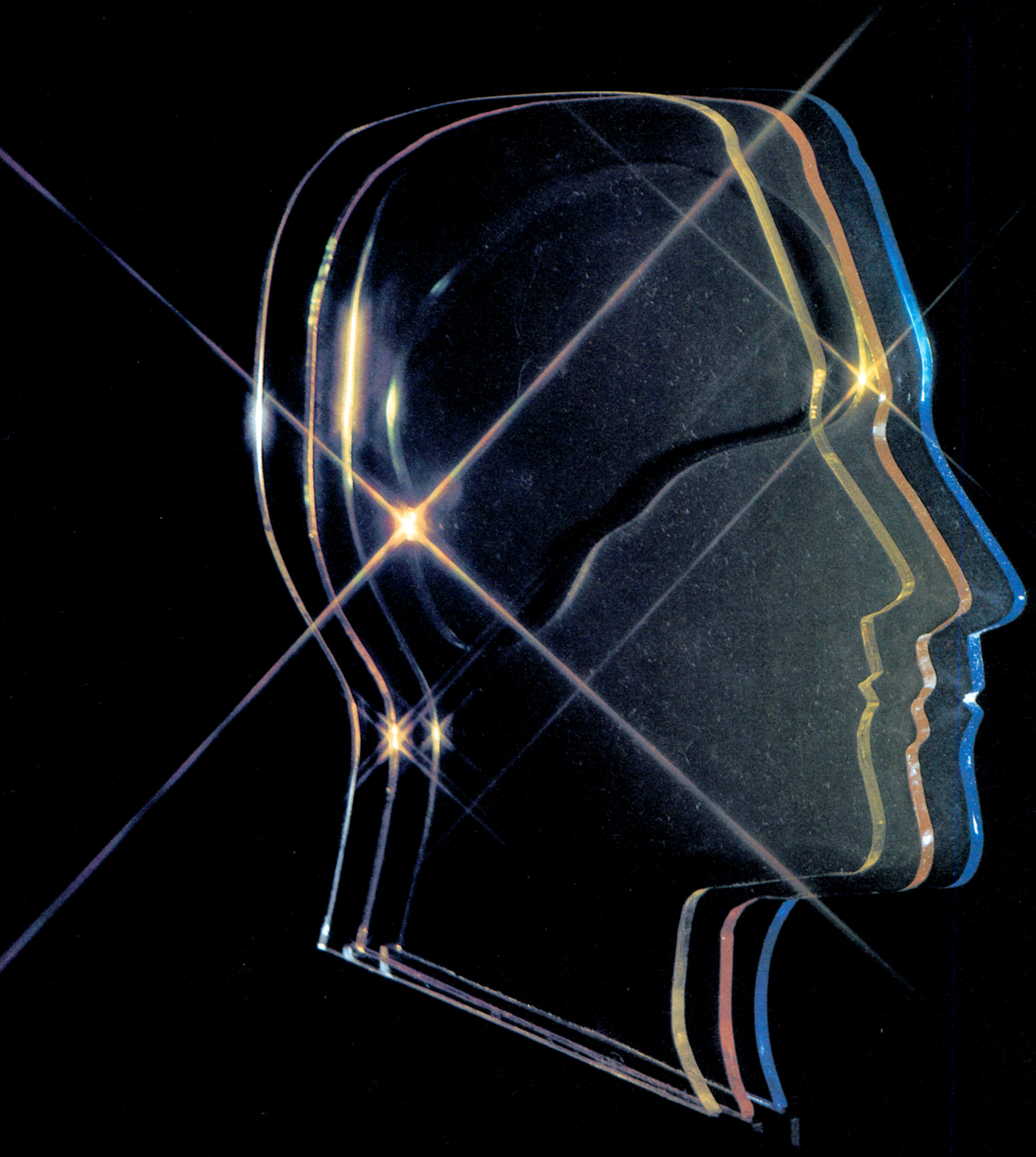
"Now I know one school that managed to get its money from working out a deal with adult education. Adult ed wanted to introduce some data processing, word processing, but didn't have a place. So this teacher said, 'Don't you have some classes in our school? Set it up in my room, I'll help you teach it.' So they set it up. He helped the adult ed classes get started but he had use of the computer all day."

With a little luck . . .

"When we first got our Apples of course we got as many as we could with what little money we had. So we bought 16k Apples and we used old television sets and tape recorders—minimal—and the first thing some teacher wanted to do was to computerize all of her grade books. And so we in our naiveté asked Apple how to do it. They just laughed. You can't do it on a 16k Apple with a tape recorder for memory storage. But I had a seventh grader who had just seen his computer for the first time about a week before. He said, 'I bet I can figure that out.' And he proceeded to do it. Now, it wasn't elegant, and it wasn't sophisticated. But it worked!

continued on page 54

CONSIDER THE CLASSRO



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CIRCLE 23

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continued from page 51

Because nobody had told him it couldn't be done. He went home and did it.

"I think this is one of those rare things where one person can do it—get them into the schools. Particularly if you don't go at it like a bull in a china shop. A small group will actually work better. Quite often I tell principals you will have a better program if you get just one teacher involved. Don't wait until all the teachers are involved or you're not going to get the program you want. You are far better off to start with one or two teachers and let them get their feet wet and let them try it out. Then let it grow. It may take three years to have the whole staff involved but by that time you'll have a good solid program."

There's one last alternative, if all fails in your attempts to get computers into your schools: Enroll your children in an after school program. This was mentioned by Dr. Edward Lias, Commodore Business Machines's director of education: "If parents aren't getting computer education through public schools, they will probably even pay the bill to get it through private schools. One case: the Children's Computing School in New York City, run by Dr. Eugene Galanter. He has so much business he's ready to set up his schools in Philadelphia and other cities. Galanter has stated that "Quite by accident I found out that I could train just as many parents as children. They bring their children in, the 12-year-olds and the 13-year-olds. . .the parents come in and look over their shoulder. The parents then say if I come back this evening, will you give me the same course?' and I say sure and they pay the tuition twice, because the parents take the course too. It's a great business that grows out of the school's neglect."

Dr. Molnar of the National Science Foundation has claimed that the basic workforce survival tool of the coming generation will be computer literacy (not programming per se—just literacy) as linguistic literacy was the necessity at the turn of the century, and a high school diplomacy the borderline between hope and hopelessness at the century's midway mark. Dr. Lias observed that we are training our youth for jobs that do not exist yet—that he himself holds one that did not exist when he was a student—jobs whose natures we barely can imagine.

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CIRCLE 30

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CIRCLE 31

Cupertino Cowgirl Pioneers Computers

Fifty years ago, the town of Cupertino, California was about as familiar to U.S. citizenry as Plains, Georgia.

Today, anyone who knows anything about high technology knows about Cupertino, nestled in the southern part of Silicon Valley, where plums and Apples grow.

Bobby Goodson teaches in Cupertino. An important force behind CUE, Computer-Using Educators, Goodson's voice is starting to be heard around the country–perhaps even in such a place as Plains. Devoted to a grassroots movement to get computers into the schools, Goodson likes to relate the following story:

"I was out in the schools one day and a youngster came in from the special education center. He'd been coming in fairly regularly. He was a youngster who simply did not relate well to people. The teacher would say to him, 'Donny, here are five math problems. You've got to do these.' Donny just looks at the paper. Nothing happens.

"This happened to be a school that had a parent who ran their computer program. She initiated it and it went so well that they finally hired her 3 mornings a week. So they had a person available in that school. Donny's teacher arranged to send Donny to this parent once in a while to play with the computer. They had Radio Shack's K-8 math pac with fairly simple drill and practice type programs. At the beginning of the week she would say to herself 'Donny should be working on his (let's say) multiplication'–and she would send Donny over to the computer room. That youngster came in there with the biggest smile. He would sit down at the computer and say good morning to everybody. She would have his tape ready and he would sit there.

"After half an hour of steady work, doing problem after problem–and succeeding–she would have to say 'Donny, you're going to have to go back to class because somebody else is signed up for the computer.' He would be really reluctant to leave. He would have done more math in that half hour than he normally would have done in a week. He had total success because of the way the program ran: if he made a mistake it stopped him, ran it back through, gave him some help, and let him go on. The program doesn't accept failure.

"He's happy, the teacher's happy, he's obviously learning. Something good is happening. He's gotten over the place where the hurdle was. I wish I could say that it's showed in his test scores, but I don't think we've had time to see that yet. What we did see was a child that was having no success and now he is having success. He feels good about himself and the teacher feels much better. There are all kinds of cases like this."

Goodson offers advice to parents and educators: "If you can only have one computer in your school–and all our schools started with one–take it into a fifth grade social studies class. Set it up in front of the room and put one of the social studies simulation games on it. Watch what happens to the youngsters' feelings and understanding of social studies–history in particular. It's something we've never been able to do before. The best teacher in the world could not promote the enthusiasm and the feeling a good simulation game geared to the curriculum will do.

"In that class, the best example is Oregon Trail, developed by the Minnesota Educational Computer Consortium (MECC). It fits the curriculum because we're talking about the westward expansion. It puts the youngster in Independence, Missouri, in 1871. It tells him that he's at the beginning of the Oregon Trail, a member of a family of four or five, and that they've managed to save $900 to make this trip. The trip is 2018 miles. They've got to make all of their decisions, and they've got to figure out how to spend their money. It gives them some guidance on what they're going to have to buy, and they start the trip. All the way along they have to make the decisions on whether to hunt or how well they're going to eat, of if there are riders on the horizon what will happen?

"The program's authors actually read the diaries of the people who made the trip. They figured out the probability of all the various things happening: how often did you get bitten by a snake; how often were the approaching riders hostile; what were the chances of having friendly Indians helping you. All of that is built into this program. It is historically correct. It is also geographically correct. So if you get bogged down in a mountain pass in a blizzard, the kids are going and getting a relief map and finding out from the program how many miles they've gone. They read the map to find out the name of the pass that they got bogged down in.

"Kids would initially say 'Why take six months to go from Missouri to Oregon? That's dumb. Anybody knows you can get there overnight.' Yet they go through this program and find out that they may take six months. They may not even make it. Chances are the first time they won't. They die of starvation.

"But they've always got the option of stopping and saying 'I made a bad decision. I want to start over again.' OK. The program starts over.

"The spinoffs from this are numerous. The math comes naturally as part of it. Some teachers have them graph their progress, then try to analyze why they move more slowly at certain times. They find out about the mountains and the weather . . . They're learning so much about practical everyday problem-solving, tactics and decision-making that's never written into a social studies curriculum.

Santayana said, "The great difficulty in education is to get experience out of ideas." What would he have thought of Oregon Trail?

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CIRCLE 32

Todd Zipnik

Let Your Computer Do the Programming

Program generators can save a lot of programming time and effort

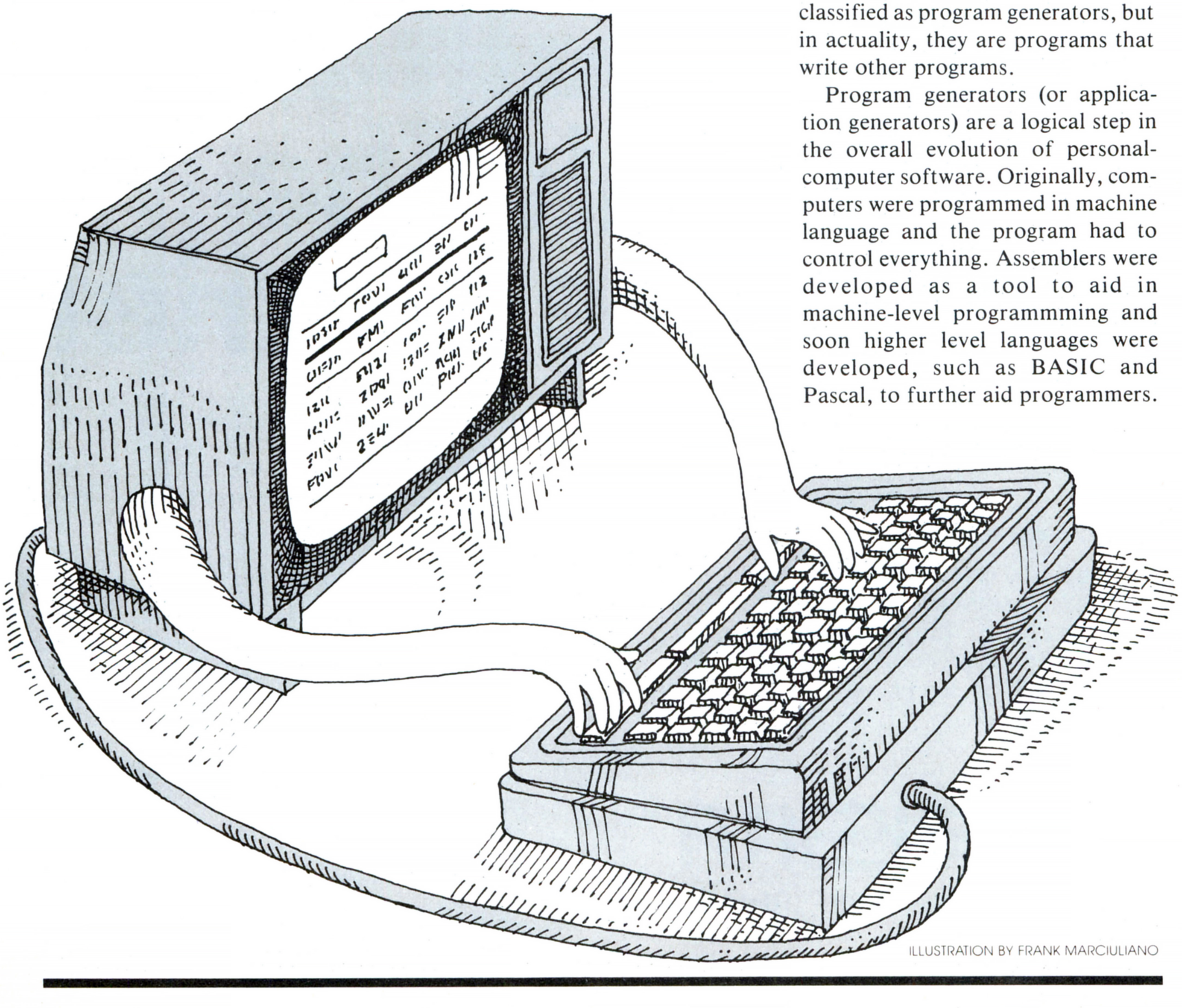
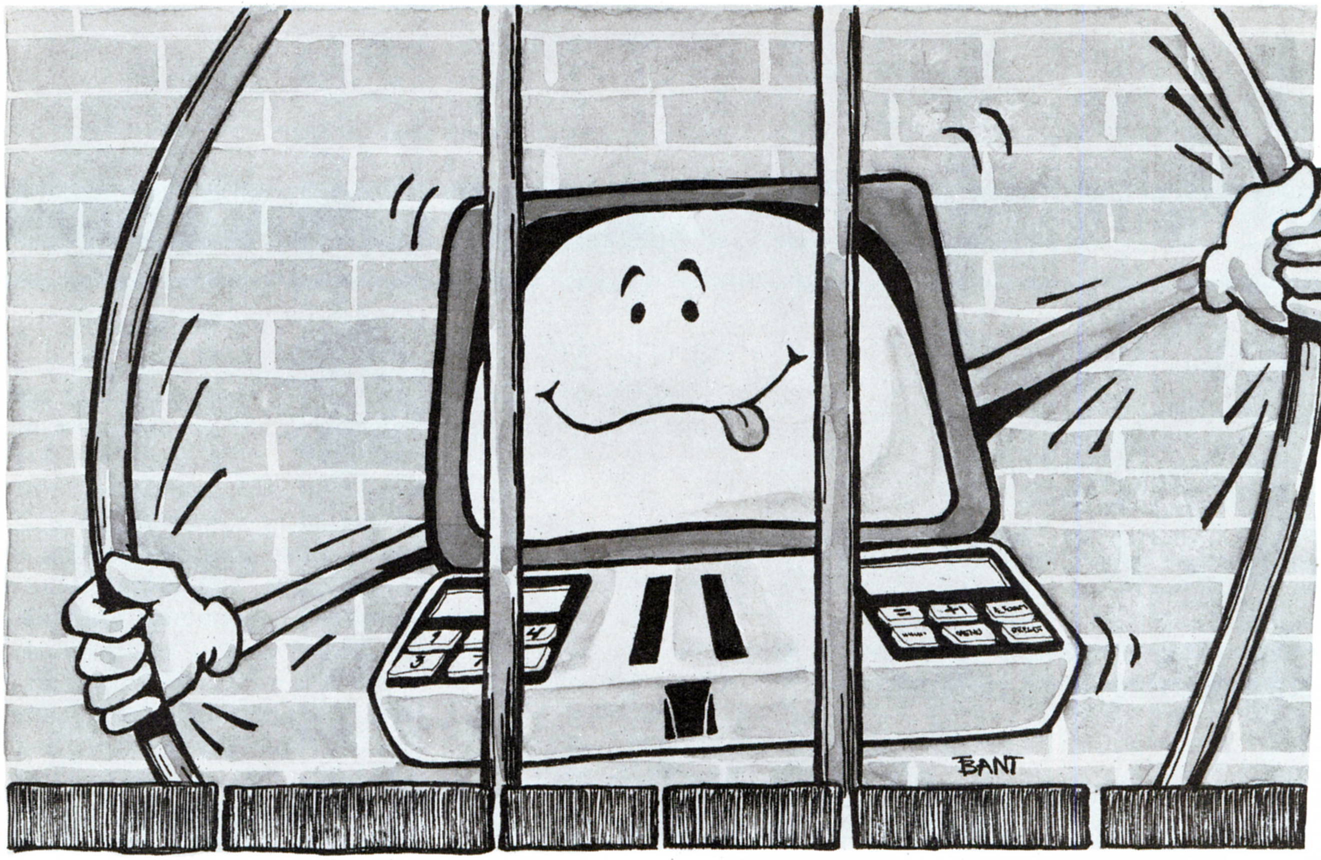


ILLUSTRATION BY FRANK MARCIULIANO

Over the past year, a new breed of software product has infiltrated the personal-computer marketplace. Its evolutionary tree contains some of the all-time greats—BASIC, Pascal and Assembly Language. Much like its ancestors, the software has started on an evolutionary cycle that could have a strong effect on the future personal-computer marketplace. The products are technically classified as program generators, but in actuality, they are programs that write other programs.

Program generators (or application generators) are a logical step in the overall evolution of personal-computer software. Originally, computers were programmed in machine language and the program had to control everything. Assemblers were developed as a tool to aid in machine-level programmming and soon higher level languages were developed, such as BASIC and Pascal, to further aid programmers.



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CIRCLE 33

Because languages such as BASIC and Pascal were easier to master, more people were attracted to the study of computers and programming.

What is a program generator?

There has been a bit of confusion surrounding the exact definition of a program generator. Most generators deal with the handling of data in one or more data bases and the reports that can be produced from these data bases. The major difference between data base management systems and program generators is that the generator will produce a bootable disk that contains all code necessary to support a data base and report formats. The data base management system, on the other hand, usually requires you to boot from a standard disk before you can handle your data base and reports.

Program generators were originally designed and offered on larger systems primarily to make work easier for the data processing (DP) departments of major corporations.

Ease of use is not the only reason these software systems are attractive. To understand the other benefits, one has to become familiar with the steps involved in the development of a software package which include: Design; Implementation; Documentation; Testing; and Support.

Design

Application design on any computer system requires some, if not considerable, effort depending, of course, on both the programmer's talent and the applcation's complexity. The designer decides what need not be done and then proceeds to outline the steps he will follow to accomplish the task. A program generator helps the designer by giving him a framework.

Implementation

Design implementation is the actual programming. Program generators are able to cut programming time by as much as 80 percent.

Documentation

Producing documentation with a program generator is an easier task due to the standard for any program generated. The software will usually handle the I/O in the same manner from program to program allowing for a structured approach towards documentation.

A good program generator will be able to document itself.

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CIRCLE 34

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McDONNELL DOUGLAS BANK OF LOUISVILLE

Impressed?

Thanks to customers like these, DB MASTER is the second fastest selling business software package for the Apple II.

Even more impressive are the comments from some of our customers. As Mr. M. Robert McElwain, Senior VP of the Bank of Louisville states, "After having purchased more than 400 software packages, I'm still trying to establish a list of top ten that I wholeheartedly endorse. I don't have ten, but I'M ONE CLOSER—DB MASTER has been added to the list. It's a real treat to acquire those which are truly outstanding. DB MASTER is quality software which I highly recommend."

Equally impressive is the range of features built into DB MASTER. As Mr. McElwain continues, "I could comment on the screen formatting, short forms, security, auto date . . . but where do I stop? With over 100 Apples, we think we recognize good software when we use it."

Our special thanks to Mr. McElwain. And to all our equally impressed customers.

As they all know, in today's highly competitive marketplace, a good name is hard to come by.

STONEWARE™
MICROCOMPUTER PRODUCTS
50 Belvedere Street, San Rafael, CA 94901 (415) 454-6500

DB MASTER is a registered trademark of Barney Stone and Alpine Software Inc. Apple II is a registered trademark of Apple Computer.

© 1981 Stoneware Microcomputer Products

CIRCLE 35

Program generators have been known to produce code having few errors. Again, because they use standard (and tested) routines, the errors are errors in the designer's logic.

Most generators handle errors by flashing a message on the screen that an error has occurred and then, depending on the type of error, directing the user to a section of the manual and/or trying to reconstruct the program.

Support

Software support is the ability to answer questions about the code, and modify it if necessary. If the software product is not documented properly, it will take an enormous amount of effort for a new suport person to review the system completely.

So much for the description of programs that can write programs. Can one buy software that will do just that for a personal computer? Indeed, and the following are descriptions of some of the available packages: CORP, PEARL, Modifiable Database, Data Reporter and The Last One.

CORP

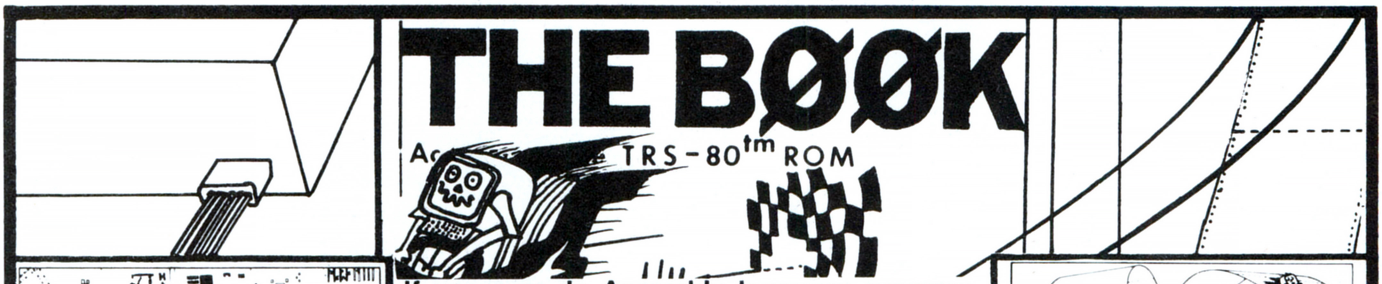
CORP (Combined Operating Re-Entrant Programming), is a program generator that writes complete data base management systems in Applesoft BASIC that can be modified to suit any application simply and effectively. The generated programs are saved on a separate disk and execute without the CORP master disk. A screen is defined using English-like commands to generate a complete data-entry program. This information is then used to sort, update, and generate complete program listings. No programming or knowledge of programming is required.

CORP is produced by Maromaty and Scotto Software Corporation which plans to release several other packages to work with CORP Including a menu generator so CORP generated programs may be accessed by a custom user-defined menu, and a file-conversion program to allow users to convert their present data files to CORP-compatible files.

PEARL

PEARL (Producing Error-free Automatic Rapid Logic), offered by Computer Pathways Unlimited, runs under the CP/M operating system. There are currently three versions of the product, each more capable than the other. The program generates MBASIC statements that can then be compiled by Microsoft's MBASIC compiler.

PEARL Level 3 is a program gen-



If you ever do Assembly language programming, or you just want to know more about your TRS-80 ROM, "THE BOOK"s are for you.

*TRS-80 is a trademark of Tandy Corp.

Each volume is priced at: $14.95 + $1.50 S&H = $16.45 ($17.05 in VA) Overseas add $2.50 for air shipment

Insiders Software Consultants, Inc.
P.O. Box 2441, Dept. UM2
Springfield, VA 22152

☐ Please send me Volume I of THE BOOK

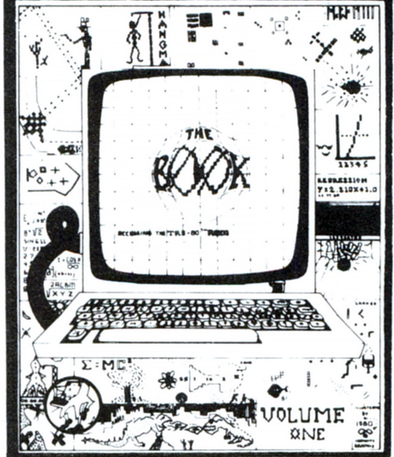
☐ Please send me Volume II of THE BOOK

NAME
ADDRESS
CITY, STATE ZIP CODE

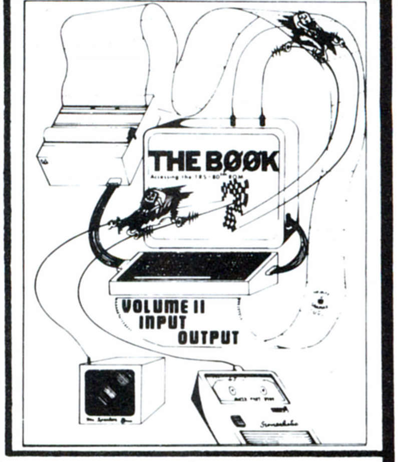
☐ Check payable to Insiders Software Consultants, Inc.
☐ MASTER CHARGE MC Bank Code
☐ VISA Exp. Date Card Number

Signature

Dealer Inquiries Invited



Volume I: The most comprehensive book yet on the math routines in Level II ROM, Models I & III. Includes a fully commented listing from 0708H to 1607H and an incredibly complete map of the ROM and reserved areas of RAM.

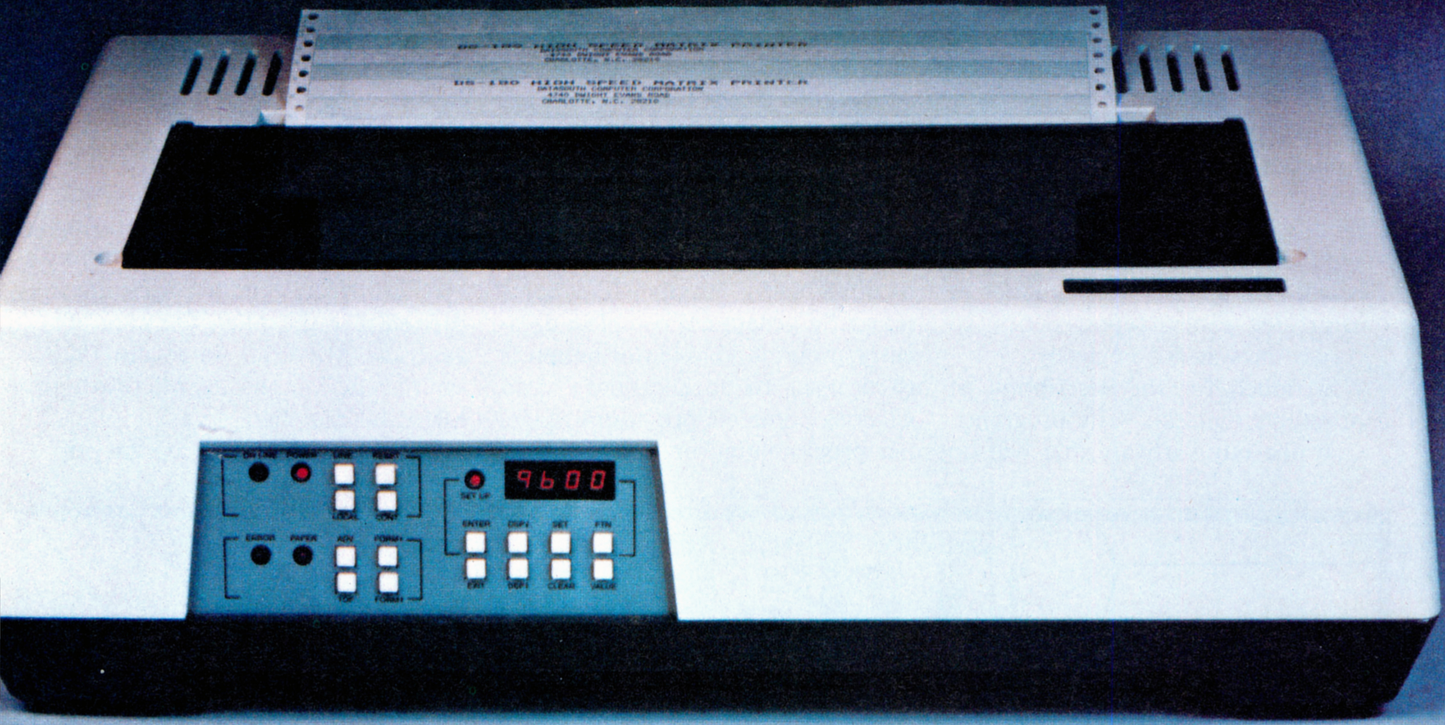


Volume II: Everything you want to know about the video, keyboard, cassette, and printer driver routines. Learn how to write your own! Remarkably detailed listings illustrate well-commented source code. Complement Volume I, now.

CIRCLE 36

datasouth announces...

THE TOTAL PRINTER PACKAGE!



With so many matrix printers on the market today, it may seem tough to find exactly the right one for your application. Some models may offer the speed you need, others the communications flexibility and still others the forms handling capability. But no printer offers **all** the features you need...until now.

The DS180 matrix printer provides the total package of performance features and reliability required for applications such as CRT slave copy, remote terminal networks and small to mid-range systems. Not a "hobby-grade" printer, the DS180 is a real workhorse designed to handle your most demanding printer requirements. And pricing on the DS180 is hundreds of dollars below competitive units.

High Speed Printing—Bidirectional, logic-seeking printing at 180 cps offers throughput of over 200 lpm on average text. A 9-wire printhead life-tested at 650 million characters generates a 9x7 matrix with true lower case descenders and underlining.

Non-volatile Format Retention—a unique programming keypad featuring a non-volatile memory allows the user to configure the DS180 for virtually any application. Top of form, horizontal and vertical tabs, perforation skipover, communications parameters and many other features may be programmed and stored from the keypad. When your system is powered down, the format is retained in memory. The DS180 even remembers the line where you stopped printing. There is no need to reset the top of form, margins, baud rate, etc.... it's all stored in the memory. If you need to reconfigure for another application, simply load a new format into the memory.

Communications Versatility—The DS180 offers three interfaces including RS232, current loop and 8-bit parallel. Baud rates from 110-9600 may be selected. A 1K buffer and X-on, X-off handshaking ensure optimum throughput.

Forms Handling Flexibility—Adjustable tractors accommodate forms from 3"-15". The adjustable head can print 6-part forms crisply and clearly making the DS180 ideal for printing multipart invoices and shipping documents. Forms can be fed from the front or the bottom.

If you would like more information on how the DS180's low-cost total printer package can fill your application, give us a call at Datasouth. The DS180 is available for 30-day delivery from our sales/service distributors throughout the U.S.

CIRCLE 37

datasouth
computer corporation

FEATURES OF PROGRAM GENERATORS

	CORP	PEARL	MODIFIED DATA BASE	DATA REPORTER	THE LAST ONE
Screen editor	Y	N	N	N	Y
Report editor	Y	Y	N	Y	Y
Span disk drives	Manual	Automatic	Manual	Manual	Manual
256 byte records	N	N	N	N	N
Subtotal and total capabilities on reports	Y	Y	N	Y	Y
4 function math	Y	N	Y	Y	Y
Cross referencing other files for information	Y	Y	N	N	Y
Default data	N	Y	Y	Y	Y
Assembly language routines built in for greater disk access	N	N	Y	Y	N
Help screens	N	N	N	N	Y
Mimimum number of disks needed to manage data base	1	2	1	1	2
Maximum number of drives supported	1	any number	2	2	any number
Ability to define attributes	Y	Y	Y	Y	Y
Price	189.95	650.00	79.95	150.00	600.00

continued on page 140

WE HAVE A PROBLEM WITH OUR SOFTWARE

The problem is that it is underpriced! Potential buyers don't believe the accounting software has much capability at $450, so they buy software with less capability at $1000.

What do the ones who buy it say?

"I have become more and more convinced . . . it is one of the best bargains available . . ."

80 REVIEW, 80 MICROCOMPUTING, June 81.

"The single data diskette with common files is really convenient . . ."

Randy Bemis, Bemis Construction, San Diego.

"I recommend MICROED software for my computer customers."

Sandor Zoboki, President,
ZOBEX Computer Systems.

THE BUSINESS SOFTWARE NOW AVAILABLE

GENERAL ACCOUNTING PACKAGE G/L, A/R, A/P	$450.00
INVENTORY I	$250.00
PAYROLL	$250.00

System requirements: CP/M, 64K memory, two disk drives, 132 column printer

TRS-80, Model II SOFTWARE NOW AVAILABLE

1.4 CP/M single or double density auto-select	Special $90.00
SMARTERM Versatile terminal program, requires CP/M	$50.00

We are dedicated to selling quality business software at reasonable prices.

Dealers, we have a deal for you.
Write or Call **MICROED**
3910 BANDINI STREET, SAN DIEGO, CALIFORNIA 92103 • (714) 299-1125

WE HONOR master charge THE INTERBANK CARD
VISA

22 Ways To Rule Receivables

Is your cash flow held up? Have your receivables wrinkled from too much aging? Do you know exactly who owes what and for how long?

F MARK 42
7
8
9
4
5
6
1
2
3

PHOTO BY KENNETH W. SCHROERS

Many years ago a business magazine gave a humorous clue as to how crucial accounts receivable functions are to any business. One cartoon showed a business owner leaping from the window of a flaming office building. In his hands was one of his most essential business records: an accounts receivable ledger.

To put it bluntly, accounts receivable is the lifeblood of most businesses. It is the basic, complete and accurate record of all money owed to and received by a business, along with who owes that money. Like your own blood, it must be given the proper ''nourishment'' or it will be unable to keep the business alive.

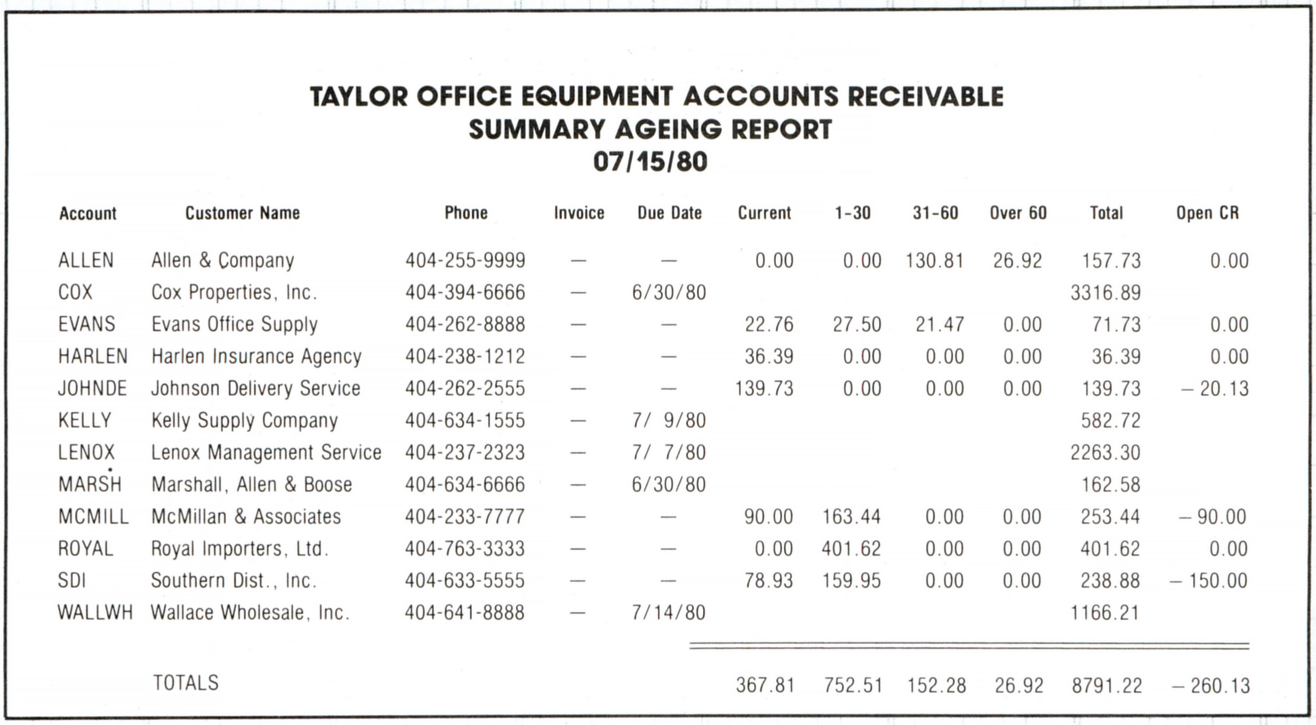
Six functions

A/R performs six basic functions:

- Maintains complete and accurate customer files;
- Keeps a history of each account, both current and aged (aged accounts are amounts of money overdue, or unpaid under some financial arrangement);
- Generates monthly statements including the length of time past due amounts have gone unpaid;
- Produces overdue notices, which indicate how much is overdue;
- Applies cash and receipts, such as checks and money orders, to the correct accounts and subtracts those amounts from the total outstanding;
- Closes and balances the books each period and begins a new month with ''aged'' receivables.

The purpose of A/R is to convert outstanding debts into cash to pay bills and payrolls, increase profits and help the company grow. As any small business owner knows, cash flow is the name of the game, espe-

Robert L. Perry



```
                TAYLOR OFFICE EQUIPMENT ACCOUNTS RECEIVABLE
                          SUMMARY AGEING REPORT
                                07/15/80

Account  Customer Name             Phone         Invoice  Due Date  Current    1-30    31-60  Over 60     Total    Open CR

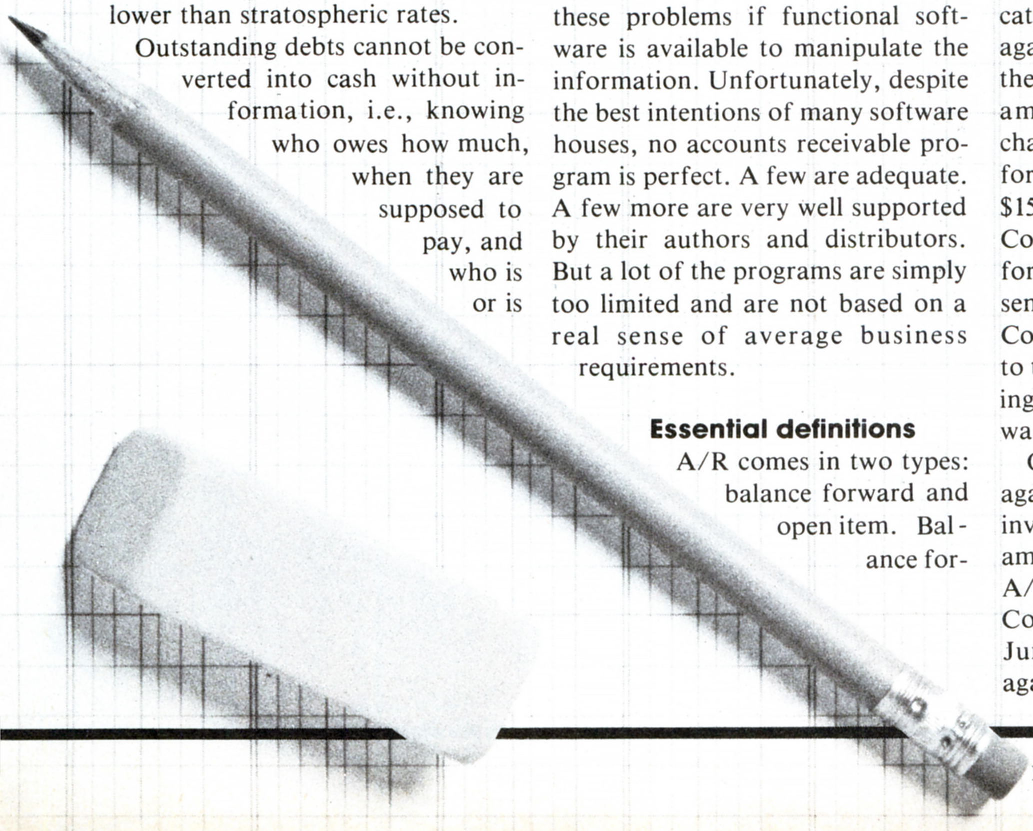
ALLEN    Allen & Company           404-255-9999    —         —        0.00     0.00   130.81    26.92    157.73      0.00
COX      Cox Properties, Inc.      404-394-6666    —      6/30/80                                        3316.89
EVANS    Evans Office Supply       404-262-8888    —         —       22.76    27.50    21.47     0.00     71.73      0.00
HARLEN   Harlen Insurance Agency   404-238-1212    —         —       36.39     0.00     0.00     0.00     36.39      0.00
JOHNDE   Johnson Delivery Service  404-262-2555    —         —      139.73     0.00     0.00     0.00    139.73    - 20.13
KELLY    Kelly Supply Company      404-634-1555    —      7/ 9/80                                         582.72
LENOX    Lenox Management Service  404-237-2323    —      7/ 7/80                                        2263.30
MARSH    Marshall, Allen & Boose   404-634-6666    —      6/30/80                                         162.58
MCMILL   McMillan & Associates     404-233-7777    —         —       90.00   163.44     0.00     0.00    253.44    - 90.00
ROYAL    Royal Importers, Ltd.     404-763-3333    —         —        0.00   401.62     0.00     0.00    401.62      0.00
SDI      Southern Dist., Inc.      404-633-5555    —         —       78.93   159.95     0.00     0.00    238.88   - 150.00
WALLWH   Wallace Wholesale, Inc.   404-641-8888    —      7/14/80                                        1166.21
                                                                  ===================================================
         TOTALS                                                     367.81   752.51   152.28    26.92   8791.22   - 260.13
```

INFOSYSTECH's package allows for printing on forms or on stock paper.

cially when inflation is raging and no bank is willing to loan money at lower than stratospheric rates.

Outstanding debts cannot be converted into cash without information, i.e., knowing who owes how much, when they are supposed to pay, and who is or is not paying according to schedule.

Microcomputers can easily solve these problems if functional software is available to manipulate the information. Unfortunately, despite the best intentions of many software houses, no accounts receivable program is perfect. A few are adequate. A few more are very well supported by their authors and distributors. But a lot of the programs are simply too limited and are not based on a real sense of average business requirements.



Essential definitions

A/R comes in two types: balance forward and open item. Balance forward is the simplest. It lumps all charges made to an account into one category and applies any payments against the total (applying against the "oldest balance owed"). For example, Company A has three charges: one for $50 on June 1, one for $100 on June 15 and another for $150 on June 25 a for total of $300. Company B sends Company A a bill for $300 on July 1, and Company A sends a check for $150 on July 15. Company B would apply the check to the entire lump sum of $300, leaving an unpaid balance of $150 to forward to their account.

Open item applies cash receipts against each outstanding charge or invoice. To continue the above example: If Company B used open item A/R, $50 would be applied from Company A's $100 payment to the June 1 charge of $50, and $100 against the $100 charge on June 15.

That would leave the $150 charge of June 25 outstanding.

Open item can be advantageous to customers depending on a finance charge system. Under balance forward, any monthly finance charge could be applied to the outstanding total of $300 for the month of July. Under open item, the finance charge may be staggered according to the length of time the charges are outstanding.

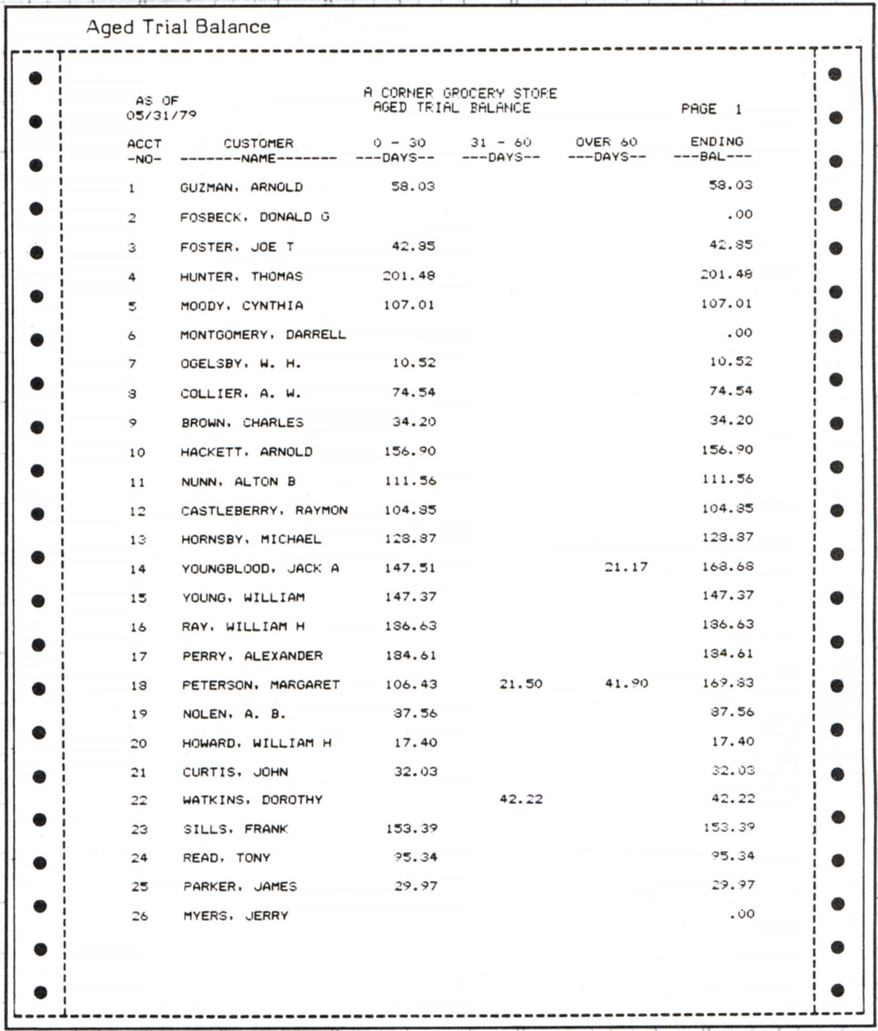
Until recently, most software houses wrote A/R programs using only one of the two methods. More and more houses are now modifying their software to allow both B/F or OI, or either of the methods, to apply to various customer accounts.

Common features

Every A/R program shares common features, produces similar reports and journals, and generates similar statements. Each customer account is established in a file with a history of current or recent transactions. The account listing keeps all information about the customer, i.e., name, address, finance charge rate (if included), sales tax rate (if included), amount owed, credit terms, date of last transaction, and others.

Each program has some kind of transactions file in which daily entries

continued on page 68



Aged Trial Balance

```
                                  A CORNER GROCERY STORE
  AS OF                            AGED TRIAL BALANCE                     PAGE  1
05/31/79

ACCT       CUSTOMER              0 - 30      31 - 60    OVER 60       ENDING
-NO-  -------NAME-------      ---DAYS--     ---DAYS--  ---DAYS--     ---BAL---

1     GUZMAN, ARNOLD            58.03                                   58.03

2     FOSBECK, DONALD G                                                   .00

3     FOSTER, JOE T             42.85                                   42.85

4     HUNTER, THOMAS           201.48                                  201.48

5     MOODY, CYNTHIA           107.01                                  107.01

6     MONTGOMERY, DARRELL                                                 .00

7     OGELSBY, W. H.            10.52                                   10.52

8     COLLIER, A. W.            74.54                                   74.54

9     BROWN, CHARLES            34.20                                   34.20

10    HACKETT, ARNOLD          156.90                                  156.90

11    NUNN, ALTON B            111.56                                  111.56

12    CASTLEBERRY, RAYMON      104.85                                  104.85

13    HORNSBY, MICHAEL         128.87                                  128.87

14    YOUNGBLOOD, JACK A       147.51                  21.17           168.68

15    YOUNG, WILLIAM           147.37                                  147.37

16    RAY, WILLIAM H           186.63                                  186.63

17    PERRY, ALEXANDER         184.61                                  184.61

18    PETERSON, MARGARET       106.43      21.50       41.90           169.83

19    NOLEN, A. B.              87.56                                   87.56

20    HOWARD, WILLIAM H         17.40                                   17.40

21    CURTIS, JOHN              32.03                                   32.03

22    WATKINS, DOROTHY                     42.22                        42.22

23    SILLS, FRANK             153.39                                  153.39

24    READ, TONY                95.34                                   95.34

25    PARKER, JAMES             29.97                                   29.97

26    MYERS, JERRY                                                        .00
```

BPI offers a detailed A/R ledger and skeleton general ledger for double-entry accounting.

STRUCTURED SYSTEMS FINANCIAL SOFTWARE.

ANYTHING LESS IS CHEATING YOUR OWN BUSINESS.

Penny wise and software foolish. One of the best ways to cheat your business is to waste a whole lot of time on solutions that don't work, or that can't grow with your business. And frankly, we get phone calls every day from computer users who've tried to get by on "bargain" software, and found that "bargain" software is the most expensive kind a business can own.

Here's a fact: if you have a real need for a computer in any of these areas:

General Ledger
Accounts Receivable
Accounts Payable
Order Entry
Inventory Control
Payroll,

any business software less than Structured Systems Financial Software is cheating your business. You'll cheat yourself out of lots of time. Time spent with systems which aren't designed for high volume use. You'll cheat yourself out of reliable audit controls and reliable error prevention features. Out of the training you invest in a system you outgrow when you need to add more disk storage, more customers, more data. You'll be cheating yourself out of a software bargain in the truest sense of the word—the greatest value for your dollar.

CP/M® microcomputer systems can do the job of minicomputers. Structured Systems software makes that potential a reality. Right now, hundreds of businesses are profiting from the financial controls and operating efficiency of SSG financial software. So can yours.

Structured Systems Group
Structured Systems Group
Structured Systems Group

Take it easy on yourself. But sentence your computer to hard labor.

Please send more information on your

☐ General Ledger ☐ Accounts Receivable ☐ Order Entry
☐ Accounts Payable ☐ Payroll ☐ Inventory Control

Name ____________
Company ____________
Address ____________
City State Zip ____________
Telephone (   ) ____________

CP/M is a registered trademark of Digital Research.

Structured Systems Group
INCORPORATED
5204 Claremont, Oakland, California 94618 (415) 547 1567

CIRCLE 39

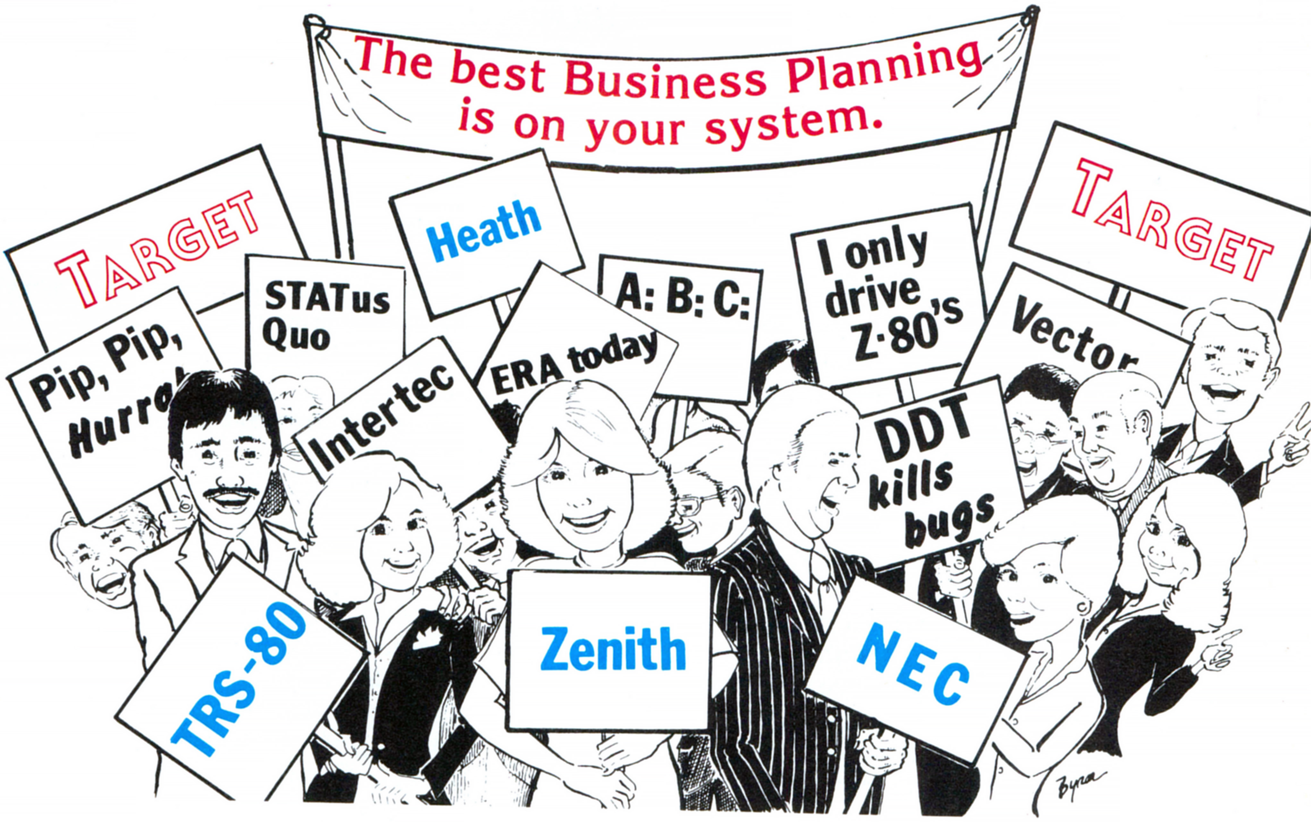
TABLE 1

TABLE OF ACCOUNTS RECEIVABLE FEATURES

FEATURES/COMPANY	AMERICAN BUSINESS SYSTEMS	APF ELECTRONICS	BUSINESS ENHANCEMENT COMPUSERVICE	BPI SYSTEMS, INC.	COMPUTER PRODUCTS INTERNATIONAL, INC.	COMPUTER SYSTEMS DESIGN	CROMEMCO, INC.	DESIGN SOFTWARE	GRAHAM-DORIAN	INTERNATIONAL MICRO	INFOSYSTECH	MICRO BUSINESS SOFTWARE	MICRO ARCHITECT	MICROSOURCE	NORTH STAR COMPUTERS	RADIO SHACK	PEACHTREE SOFTWARE	SMALL BUSINESS COMPUTER SYSTEMS, INC.	STRUCTURED SYSTEMS GROUP	SYSTEMS PLUS	TARANTO & ASSOCIATES	VANDATA
Balance Forward		●	●			●	●			●				●				●			●	
Open Item									●	●			●							●		●
Both B/F and O/I	●				●			●				●				●						
Either B/F or O/I				●							●				●		●		●			
Aging Periods: 30-day—	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
60-day—	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
90-day—	●	●	●	●	●	●	●	●	●	●		●		●	●	●	●	●	●	●	●	●
120-day—	●			●	●	●	●	●	●	●		●			●		●			●		
Payment Methods On Account—		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●	●
Partial—										●						●				●		
Oldest Invoice—					●			●		●	●	●			●	●	●		●	●		●
Processing Method: Batching—		●	●		●	●	●			●	●			●		●		●	●		●	●
Automatic Posting—	●			●				●	●			●	●		●		●			●		
Customized Terms				●	●					●	●				●	●	●			●		
Finance Charge Calculations	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Auto. Integration: Order entry—			●							●		●										
Gen. Ledger—	●		●	●			●		●	●	●	●		●	●	●	●		●	●	●	●
Sales Analysis—				●						●												
Inventory—				●						●				●								
Integration Method: Summary Month-end—	●		●	●			●			●	●	●		●		●	●		●	●	●	●
Automatic—										●				●								
Preprinted Forms				●	●		●		●		●	●			●	●	●		●	●	●	●
On-line Inquiries	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●
Sales Tax Applied: State and Local—											●					●	●				●	●
State Only—	●	●		●				●	●	●		●	●	●	●			●	●	●		
Unapplied Cash Post Remittance Advice												●				●						
Mailing Labels		●	●	●		●							●		●	●					●	

continued on page 70

STAND UP, CP/M USERS



For the past few months you have patiently endured the indignity of watching your friends show off their flashy visible number cruncher on their game-playing computer and longed for something as slick.

You seriously considered buying *their* computer, but you just couldn't give up the benefits of the CP/M operating system.

Well, say hello to TARGET™, the best business planning system available on micros today (and some big computers besides).

Talk about a blank ledger sheet or columnar tabulator! TARGET™ is much more than that. Sure, just like their product, you can fill in the rows and columns as you see fit and the numbers will whiz by you on the screen. But, we let you create your report in English, not in some combination of reverse Polish notation and algebraic matrix languages.

Our TARGET on *Your* System. . .

```
LINE 1 SALES = 100 200 300 400
LINE 2 EXP   = GROW 50 BY 15%
LINE 3 NET   = SALES - EXP
```

Their Product on *Their* System . . .

```
SALES 100 200 300 400
EXP 50  +B2*1.15 +C2*1 +D2*1.15
NET  +B1-B2 +C1-C2 +D1-D2 +E1-E2
```

At least, that is what their product might look like if you could see all of your data and calculation rules at the same time, *which you can't.* If you think that it is an easy approach for debugging, guess again.

TARGET™ displays a full screen of results or data and calculation rules at your command. And, it runs on your system. How much more could you ask?

Lots! And TARGET™ delivers. We give you the ability to:

- Obtain hard copy printouts of *both* the results *and* your set of data and calculation rules used to create those results.
- Write the results of data and calculation rules to the disk as formatted files for word processing.
- Use full conditionals (IF . . . THEN . . . ELSE) in your set of rules and stack conditionals within conditionals.
- Build powerful models with commands such as GROW, MIN, MAX, AVE, CUM, GREATER, LESSER, SUM.
- Edit lines with ease.
- Enter rules and data in any order you wish. TARGET™ will automatically sort rows in ascending order *and* process your model correctly even if LINE 33 SALARIES needs to be calculated before LINE 3 EXPENSES.

There is so much more about the TARGET™ Planner that will impress you. Our manual explains not just what a command or function is, but how to use the functions in everyday business situations. Our manual and our newsletter give you illustrative examples of business planning problems and how TARGET™ can help you solve those problems. For example, we will show you how to quickly determine the payback period for a proposed project.

TARGET™ is a compiled system running under CP/M. There is no need to buy BASIC or FORTRAN or any other system software. And the price is *only $195* for the TARGET™ Planner, our basic system.

Stand up and be proud, CP/M users. The best business planning system runs on the best operating system on *your* computer.

Advanced Management Strategies, Inc.
1935 Cliff Valley Way, N.E., Suite 200
Atlanta, Georgia 30329
404/634-9535

P.S. When all of your friends start drooling over *your* product, tell them to cheer up. With Microsoft's great SoftCard and 16-K memory board, your friend's Apple can move up to your operating system and run TARGET™

CIRCLE 125

CP/M is a registered trademark of Digital Research.
SoftCard is a trademark of Microsoft.
TRS-80 is a trademark of Tandy Corporation.

are posted to each customer account either by batch processing, or with automatic posting, to an account. They all "age" each customer account each month and divide the amount of money owed each account into time periods. The standard used in credit and collections practice for decades is current (or 0–30 days), 30 days, 60 days, and 90 days and older. Many A/R packages add one more division, 120 days and older. Only one package allows for user-defined time periods.

A majority of the packages discussed here integrate to general ledger, but almost all do so in a simple manner—a summary of accounts or an aged trial balance posted to general ledger at the end of each month. Few automatically post each change in A/R to an on-line general ledger, keeping the general ledger current each day.

While many programs share common features, they do not share methods of interaction or operation. All are menu-driven and are organized similarly. For example, Radio Shack's A/R program has a main menu that maintains accounts, enters sales, enters cash receipts, adjusts entries, creates invoices, maintains current activity, posts transactions, calls up reports, and conducts end-of-period and end-of-year processing. In addition, Peachtree Software's A/R (Vector Graphic's version) deletes transactions, initializes the system, reconciles open credits and verifies the file structure, but does not allow for end-of-year processing in the main menu. These subtle differences are found in every package, but they are, in some cases, more important than many of the publicized outstanding features.

Important differences occur in the packages' reports which are crucial. The way they present critical information can make it easier or harder for a business owner to know how well his cash is flowing. Some packages produce as few as four reports or journals: customer list, aged receivables report or trial balance, cash receipts, and transaction listing. Some allow up to a dozen or even 20 reports, many with user-definable features. American Business Systems, for example, includes sales, cash receipts, debit and credit entry lists and posting reports, cash journal, sales journal, and general ledger posting report.

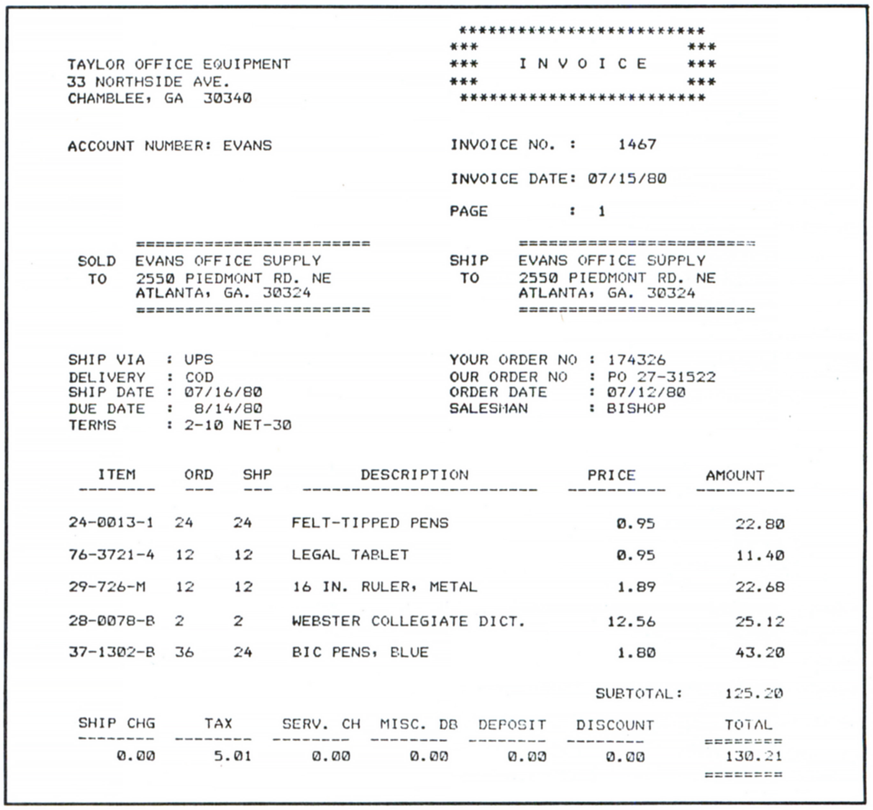
The detail included in each report means the difference between a useful and a worthless report. Most packages produce clear reports with a wealth of detail, although several cram too much into too little space, making the information hard to read and harder to understand.

Also common to all A/R packages is the customer statement which includes: customer name and address, customer number, invoice number, purchases made during the month by invoice number and/or date, payments made during the month by date or invoice number, and the aged and overdue amounts owed. A few add more detail, and many can be printed on pre-printed forms or regular paper.

User experiences

John Carmichael, the owner of an auto repair center in Menands, NY, wanted some modifications in ACCT-III which he bought from Micro Architect. He originally bought the software to automate his inventory, but later added A/R. He is now unhappy that the software will not carry past due accounts over from December to January when a new year begins.

"There is no way I can carry over a $2000 past due account broken down into aging categories. Also, most packages do not allow for a customer to pay 'on account' or for



```
                                                  ************************
                                                 ***                    ***
    TAYLOR OFFICE EQUIPMENT                      ***    I N V O I C E   ***
    33 NORTHSIDE AVE.                            ***                    ***
    CHAMBLEE, GA  30340                           ************************


    ACCOUNT NUMBER: EVANS                        INVOICE NO. :    1467

                                                 INVOICE DATE: 07/15/80

                                                 PAGE        :  1

           ========================                    ========================
     SOLD  EVANS OFFICE SUPPLY                   SHIP  EVANS OFFICE SUPPLY
      TO   2550 PIEDMONT RD. NE                   TO   2550 PIEDMONT RD. NE
           ATLANTA, GA. 30324                          ATLANTA, GA. 30324
           ========================                    ========================


    SHIP VIA  : UPS                              YOUR ORDER NO : 174326
    DELIVERY  : COD                              OUR ORDER NO  : PO 27-31522
    SHIP DATE : 07/16/80                         ORDER DATE    : 07/12/80
    DUE DATE  :  8/14/80                         SALESMAN      : BISHOP
    TERMS     : 2-10 NET-30

      ITEM     ORD   SHP          DESCRIPTION               PRICE       AMOUNT
     --------  ---   ---   ------------------------     ----------  ----------

    24-0013-1  24    24    FELT-TIPPED PENS                   0.95       22.80

    76-3721-4  12    12    LEGAL TABLET                       0.95       11.40

    29-726-M   12    12    16 IN. RULER, METAL                1.89       22.68

    28-0078-B  2     2     WEBSTER COLLEGIATE DICT.          12.56       25.12

    37-1302-B  36    24    BIC PENS, BLUE                     1.80       43.20

                                                         SUBTOTAL:      125.20

     SHIP CHG      TAX     SERV. CH  MISC. DB  DEPOSIT   DISCOUNT       TOTAL
     --------   --------   --------  --------  --------  --------     ========
         0.00       5.01       0.00      0.00      0.00      0.00       130.21
                                                                      ========
```

INFOSYSTECH's package can hold up to 1200 customers per disk.

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Alpha Syntauri Keyboard System	1399
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Romplus + Card	135
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Asynchronous Serial Interface Card (CCS)	129
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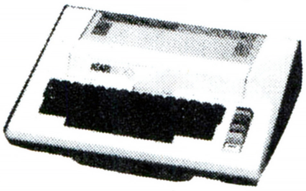
Appleplot	60
Peachtree Business	1200
VisiTerm	129
VisiTrend/VisiPlot	219
DOS Toolkit	65
Dow Jones Portfolio Evaluator	45
Dow Jones News & Quotes Reporter	85
Apple Fortran	165

Atari Personal Computer



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410 Program Recorder	59
810 Disk Drive	449
850 Interface Module	159
16K Ram Memory Module	89

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VB-3 80 x 48 VIDEO	369	429
BV-2 VIDEO	159	219
PB1 PROM PRGMMR & EPROM BOARD	139	199
CCS		
280 CPU 2810	n/a	229
64K Dynamic RAM card	n/a	499
16K Static RAM 2 MHz	n/a	249
16K Static RAM 4 MHz	n/a	269
Dbl. Density Floppy Disc Controller	n/a	299
12 Slot S-100 Mainframe	n/a	349

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$1025	$1129

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Disk drive w/out controller 439

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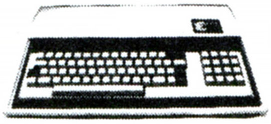

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S-100 Unit	449
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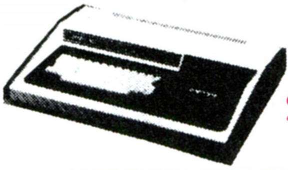
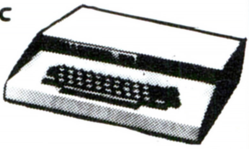
Development Pac	89

PMC-80 Micro Computer



$599

Ohio Scientific Challenger Computer.



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1P MOD II 399

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Silentype w/Apple Interface	349
Epson MX-80 F/T	649
Epson MX-100	829
Epson MX-70	339
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Paper Tiger IDS-460	1099
Paper Tiger IDS-560	1450
Qume Sprint 5/45	2495
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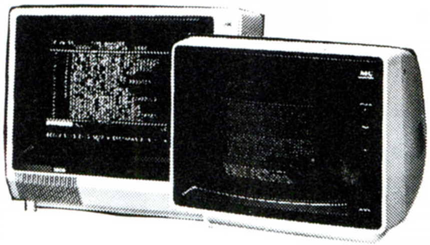
C. Itoh Starwriter 45 CPS	2249
Centronics 737	699
Watanabe DigiPlot	1149

Save on Video displays.



Amdek/Leedex Video 100 12'' B&W	139
Amdek (Hitachi) 13'' Color	359
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Panasonic 13'' Color	449
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Sanyo 13'' Color	419

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There is other business application software on the market all claiming it is the best. But, only the Dakin5 Controller Package has recently won the International Computer Programs (ICP) Award for one million dollars in sales the first year on the market.

The new Controller® 1.1 is a comprehensive accounting system comprised of Accounts Payable, Accounts Receivable and General Ledger. It has improved processing speed, requires less disk swapping and is printer independent. It's fail safe and error free, which makes The Controller ideal for the businessman who wants maximum output with no worry. The Controller package shortens bookkeeping time, allows for easy tracing of transactions thanks to audit trails, and warns of data entry errors via "audio beeps". The Controller also protects the user from losing important business information by automatically making a back-up copy of all operational data after posting. The Controller prints statements and checks and generates all reports necessary for the running of a successful business. The reports are so complete it's more like having an accountant 24 hours a day than a computer system. All of these features make The Controller software the best accounting package for your business.

What makes The Controller Package even better is **The Analyzer®** Package. The Controller software was developed to serve as an operational aid.

The Analyzer is a simple to operate management tool which utilizes The Controller as a data base. Little or no operator time is required and information is produced automatically that would be virtually impossible to generate manually. The Analyzer produces 16 decision making reports which allow for the comparison of business activities on a monthly, quarterly, and yearly basis. These include The Cash Flow Report which projects the amount of money available for the next 4 months, allowing for realistic decisions for the use of available cash. Because all financial information used by The Analyzer is produced by The Controller, tighter control can be exercised and immediate decisions can be made if the results are not as planned.

Dakin5 isn't stopping with these two products designed for the businessman. The following products will be available in early Fall, and will provide you with a complete integrated business system.

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"...committed to solving the right problems."

CIRCLE 41

TABLE 2

TABLE OF REPORTS AND JOURNALS

REPORTS/JOURNALS	AMERICAN BUSINESS SYSTEMS	APF ELECTRONICS	BUSINESS ENHANCEMENT COMPUSERVICE	BPI SYSTEMS, INC.	COMPUTER PRODUCTS INTERNATIONAL, INC.	COMPUTER SYSTEMS DESIGN	CROMEMCO, INC.	DESIGN SOFTWARE	GRAHAM-DORIAN	INTERNATIONAL MICRO	INFOSYSTECH	MICRO BUSINESS SOFTWARE	MICRO ARCHITECT	MICROSOURCE	NORTH STAR COMPUTERS	RADIO SHACK	PEACHTREE SOFTWARE	SMALL BUSINESS COMPUTER SYSTEMS, INC.	STRUCTURED SYSTEMS GROUP	SYSTEMS PLUS	TARANTO & ASSOCIATES	VANDATA
Aged A/Rs	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●		●		●
Aged Trial Balance				●	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●		●
Invoicing Regular—				●					●	●	●	●	●			●	●			●		
Credit Checking—																						
Aged Customer Statements	●	●		●	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●
A/R Detail Report	●	●		●	●		●	●		●	●	●	●	●	●	●				●		●
A/R Distribution to GL	●			●			●		●	●	●	●		●	●					●		
Customer List: Alphabetical—	●		●		●									●			●			●		
Numerical—				●		●			●	●			●					●	●			●
Either or both—		●					●	●			●	●			●	●					●	
Analysis Methods: Per customer—	●	●	●	●			●	●		●	●		●		●							
All customers—	●	●		●			●	●		●			●		●	●	●				●	
Some customers—		●						●							●							
By name—		●																				
By account number—		●						●		●												●
By category—	●	●																				
Past due—				●																		
Past Due Notices										●					●				●			
Sales Journal	●				●		●			●		●	●						●	●		
Sales Analysis: General Overall—					●																	
By customer—					●																	
By state or region—					●																	
By salesman—(CPI)					●																	
Cash Receipts	●			●	●	●	●	●	●			●	●					●				
Daily Transactions	●	●	●	●	●		●	●			●	●	●			●	●	●			●	●
Cash Applications	●									●												
Sales Commissions					●							●										
Sales Tax Register																						
Finance Charge Rept.				●			●					●			●							
Invoice Worksheet												●				●						

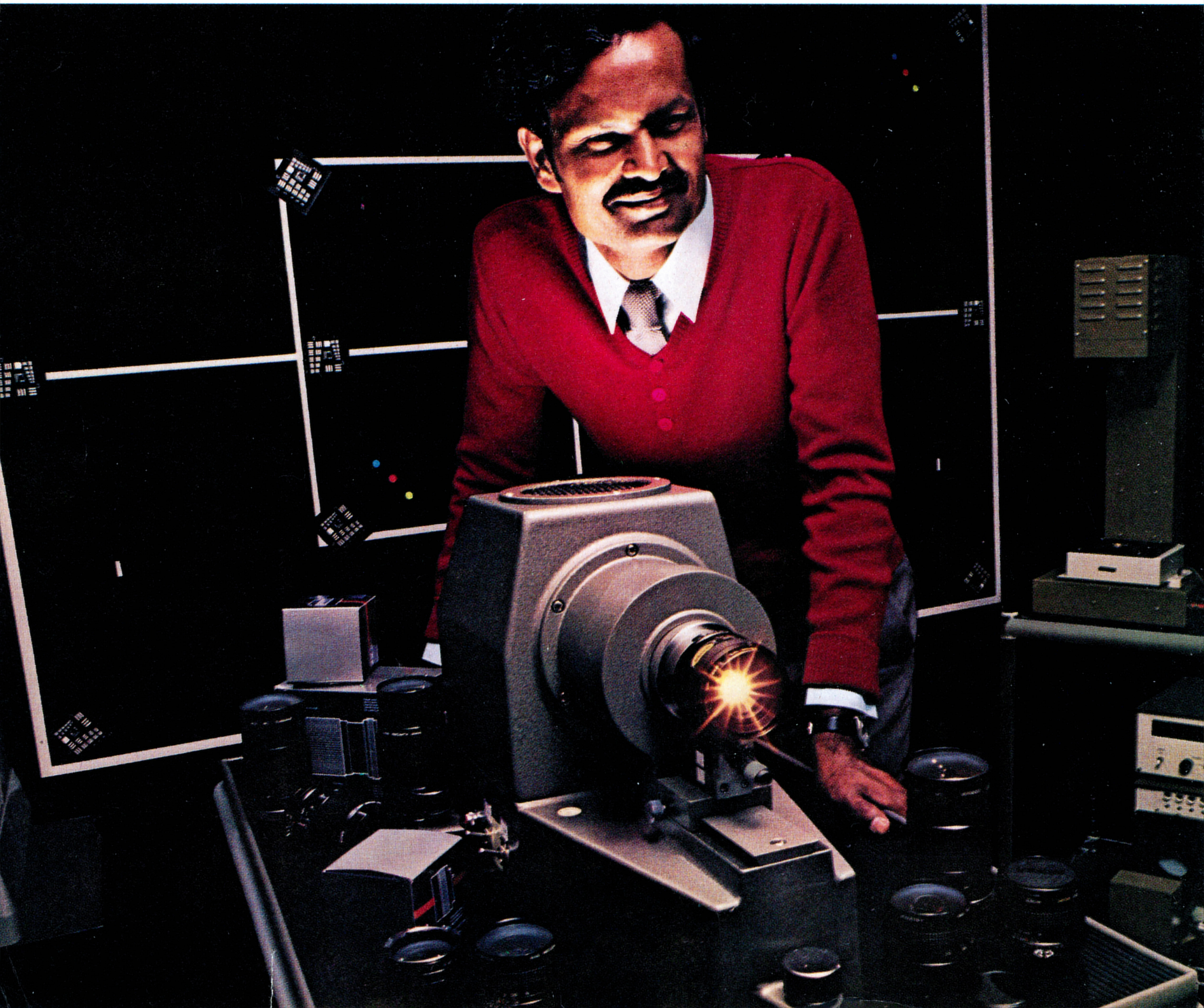
continued on page 77

Reddy Chirra improves his vision with an Apple.

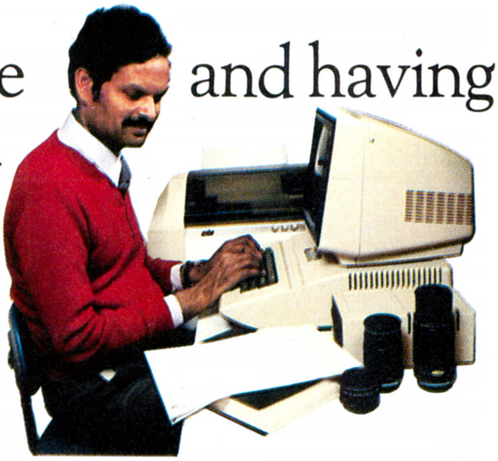
Reddy is an optical engineer who's used to working for big companies and using big mainframes.

But when he started his own consulting business, he soon learned how costly mainframe time can be. So he bought himself a 48K Apple II Personal Computer.

And, like thousands of other engineers and scientists, quickly learned the pleasures of



cutting down on shared time and having his own tamper-proof data base.



His Apple can handle formulas with up to 80 variables and test parameters on 250 different optical glasses.

He can even use BASIC, FORTRAN, Pascal and Assembly languages.

And Apple's HI-RES graphics come in handy for design.

Reddy looked at other microcomputers, but chose Apple for its in-depth documentation, reliability and expandability.

You can get up to 64K RAM in an Apple II. Up to 128K RAM in our new Apple III. And there's a whole family of compatible peripherals, including an IEEE-488 bus for laboratory instrument control.

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CIRCLE 42 FOR MORE INFORMATION

CIRCLE 124 FOR SPECIAL O.E.M. INFORMATION

Hayden Applesoft™ Compiler

A Brand New Multi-Phase Compiler That Speeds Your Program Up to 12 Times Faster — And More!

(by Jonathan Eiten) Translate your standard Applesoft BASIC program into true machine code! Now you can write and debug your programs in Applesoft BASIC, compile them and enjoy the speed inherent in executing machine language files! The longer and more complex the source program, the greater the increase in execution speed. Easy to operate, the user just specifies the name of the program to be compiled and may then BRUN the compiler program.

• TRUE INTEGER ARITHMETIC!
Sub-expressions with integer operand(s) are calculated with fast integer arithmetic routines. RESULT: Faster execution time of Applesoft intrinsics which require integer values!

• ARRAY VECTORING!
The Compiler eliminates time-consuming multiplication usually present in subscript calculation by generating sub-array look-up vectors for multi-dimensional arrays. RESULT: Greater speed enhancement for those programs with many multi-dimensional array references. The more dimensions, the greater the increase in speed.

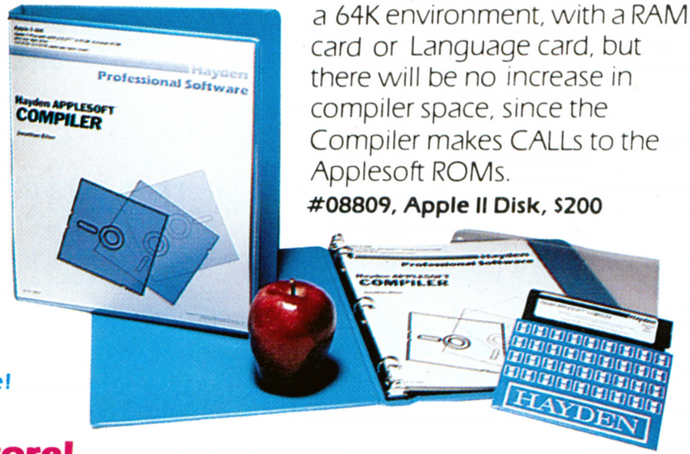
3.3 DOS Version Soon To Be Available!

• MODULAR CODE!
Starting address for a compiled module is specified prior to compilation. A CALL to this address executes the program. Adding 2 to the start address executes the program without CLEARing its variable space or RESTOREing its data-pointer. RESULT: Modules can retain their data between CALLs (local variables). Modules may CALL one another and/or may be CALLed from a real Applesoft program running under the interpreter.

• FULL COMPATIBILITY!
All Applesoft features are supported except: 1) dynamic array dimensioning, and 2) those few statements that no longer make sense outside of an interpreter environment, such as LIST and TRACE. RESULT: In executing the source program, the fact of compilation is transparent to the user.

• SYSTEM REQUIREMENTS:
The Hayden Applesoft Compiler requires 48K of RAM, Applesoft, the Autostart ROM, and at least one disk drive. No other hardware is required, and the product WILL operate in a 64K environment, with a RAM card or Language card, but there will be no increase in compiler space, since the Compiler makes CALLs to the Applesoft ROMs.

#08809, Apple II Disk, $200



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continued from page 73

a portion of a bill. Say a customer has outstanding invoices of $100, $50 and $10. He can pay the $10 bill, but he can't put $20 on account.

"At least with Micro Architect's program, say a customer has $1000 against 30-, 60- and 90-day aging. If he pays the entire $1000, the program will apply $330 to each month, instead of to each individual charge. Without these features, a bookkeeper will not use the program."

Carmichael, who has been bitten by the personal computing bug, wishes he could find or develop the perfect A/R program. " A good program would include error traps, prompts and double checks to lead you through the program and protect you from your own mistakes."

Richard Mehrlich owns Systems Plus, which distributes the AccountingPlus package. He did not write the package, but he uses it because it incorporates order entry with accounts receivable. "I would need at least four or five more people in addition to the nine I have on staff now without this package," he states.

One of the worst things a business can do is to incorrectly distribute payments across invoices and thereby deprive a customer of an owed discount. Or, even worse, bill the same customer for a bill already paid, or forget to bill a customer for a bill owed. AccountingPlus does a good job of eliminating these problems with its Order Entry package which automatically and continuously posts new sales to accounts receivable.

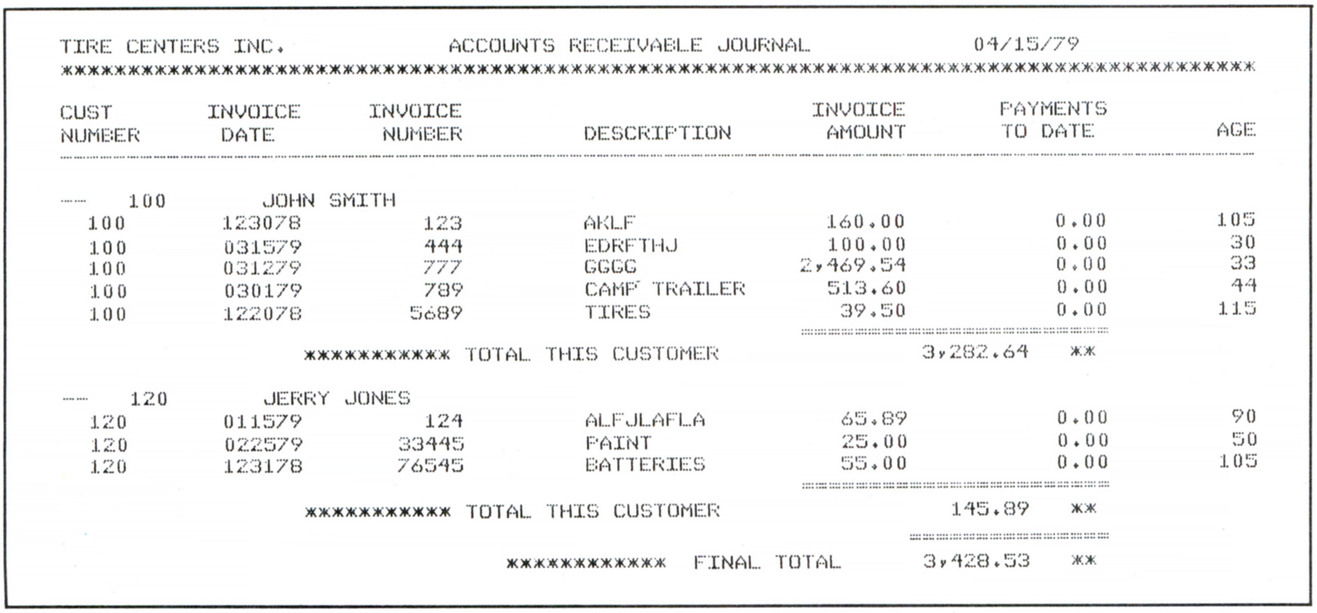
John Burr, of Computerland of Belmont, CA, another user of AccountingPlus, said the order entry integrates directly with A/R, accounts payable and general ledger. "The only time you need to go into A/R file maintenance is when you are entering a new customer's information. Otherwise, it is processed automatically through OE and cash posting. For a distributor, there is nothing better than this system."

That's the rub. Distributors, small shops, any business with fewer than 1000 customer accounts, will find the best micro-based A/R packages to be well-written and able to save them enormous amounts of time and personnel expenses. However, no one has written adequate A/R software for most retail stores, which micro hardware—especially with a Winchester disk drive—could easily accommodate.

Essential features

American Business Systems offers an A/R that accommodates up to 750 customers on two single-density, single-sided floppies. It offers both OI and BF procedures, generates audit trails, distributes cash against eight invoices, integrates to GL and produces 12 standard reports. It also allows a user to set a credit limit (an essential feature most micro-based packages do not have) and maintains the previous 12 months' sales and costs.

APF Electronics has a new A/R program for its Imagination Machine I or II. This package has a very flexible report generator and "search" function. It allows 10 selections—from all accounts to all accounts with balances over or under a limit, or 0–30, 31–60, 61–90, or over 90 day balances, and so forth—in three formats. The formats include full account printouts, names and balance lists only, or



```
TIRE CENTERS INC.             ACCOUNTS RECEIVABLE JOURNAL               04/15/79
**********************************************************************************************

CUST        INVOICE     INVOICE                                    INVOICE        PAYMENTS
NUMBER       DATE        NUMBER         DESCRIPTION                 AMOUNT        TO DATE          AGE
----------------------------------------------------------------------------------------------

--   100        JOHN SMITH
  100        123078         123          AKLF               160.00            0.00         105
  100        031579         444          EDRFTHJ            100.00            0.00          30
  100        031279         777          GGGG             2,469.54            0.00          33
  100        030179         789          CAMP TRAILER       513.60            0.00          44
  100        122078        5689          TIRES               39.50            0.00         115
                                                          ========================
                   *********** TOTAL THIS CUSTOMER                  3,282.64   **

--   120        JERRY JONES
  120        011579         124          ALFJLAFLA           65.89            0.00          90
  120        022579       33445          PAINT               25.00            0.00          50
  120        123178       76545          BATTERIES           55.00            0.00         105
                                                          ========================
                   *********** TOTAL THIS CUSTOMER                    145.89   **
                                                                   ===============
                                   *************  FINAL TOTAL       3,428.53   **
```

Graham-Dorian allows the user to set up the system according to his own specifications.

Ain't We Got Fun!
SARGON II

SARGON II (Spracklens) The first great computer chess program! "We are impressed with the program's speed, its opening book, and its much improved end game . . . Save your money and buy SARGON II . . ." '80 Software Critique. Seven levels of play, and levels 0-3 play in tournament time. It has a randomized opening book for all seven levels of play through three moves. When setting up the board, the user can scan up and down, left and right. A special hint mode included at all levels of play but 0 will suggest a good, but not necessarily the best, next move you can make. **#03404, Apple II; #03410, OSI C1P; #03418, TRS-80; #03440, OSI C4P; each tape, $29.95; #03408, TRS-80 Level II Disk; #03409, Apple II Disk; #03414, OSI C1P Disk; #03444, OSI C4P Disk; #03484, C8P Disk; each disk, $34.95.**

BLACKJACK MASTER: A Simulator/Tutor/Game (Wazaney) BLACKJACK MASTER performs complex simulations and evaluations of any playing and betting strategies that you enter into the computer. **#05303, TRS-80 Level II tape, $24.95; #05308, TRS-80 Level II Disk, $29.95**

MIND THRUST (Sackson and Wazaney) The first of its kind — an exciting game that lets you match wits with the computer! The object is to complete an unbroken chain across the board before your opponent, the computer. There's a special feature; you may switch sides whenever you wish and gain control over your opponent's pieces, but this means that the computer has control over your chain, as well. Every game is different. **#07403, TRS-80 Level II, $16.95.**

ROYAL FLUSH: Competitive Poker Solitaire (Wazaney) a game you can play alone or with any number of players. High score wins this poker-based, fun-filled card game. Choose from possible game variations. **#07101, PET; #07103, TRS-80 Level II, each tape, $14.95**

REVERSAL (Spracklens) Winner of the software division of the First International Man Machine OTHELLO™ Tournament, this version of the 200 year old game Reversi features 27 levels of play and high-resolution color graphics. **#07004, Apple II tape, $29.95; #07009, Apple II Disk, $34.95.**

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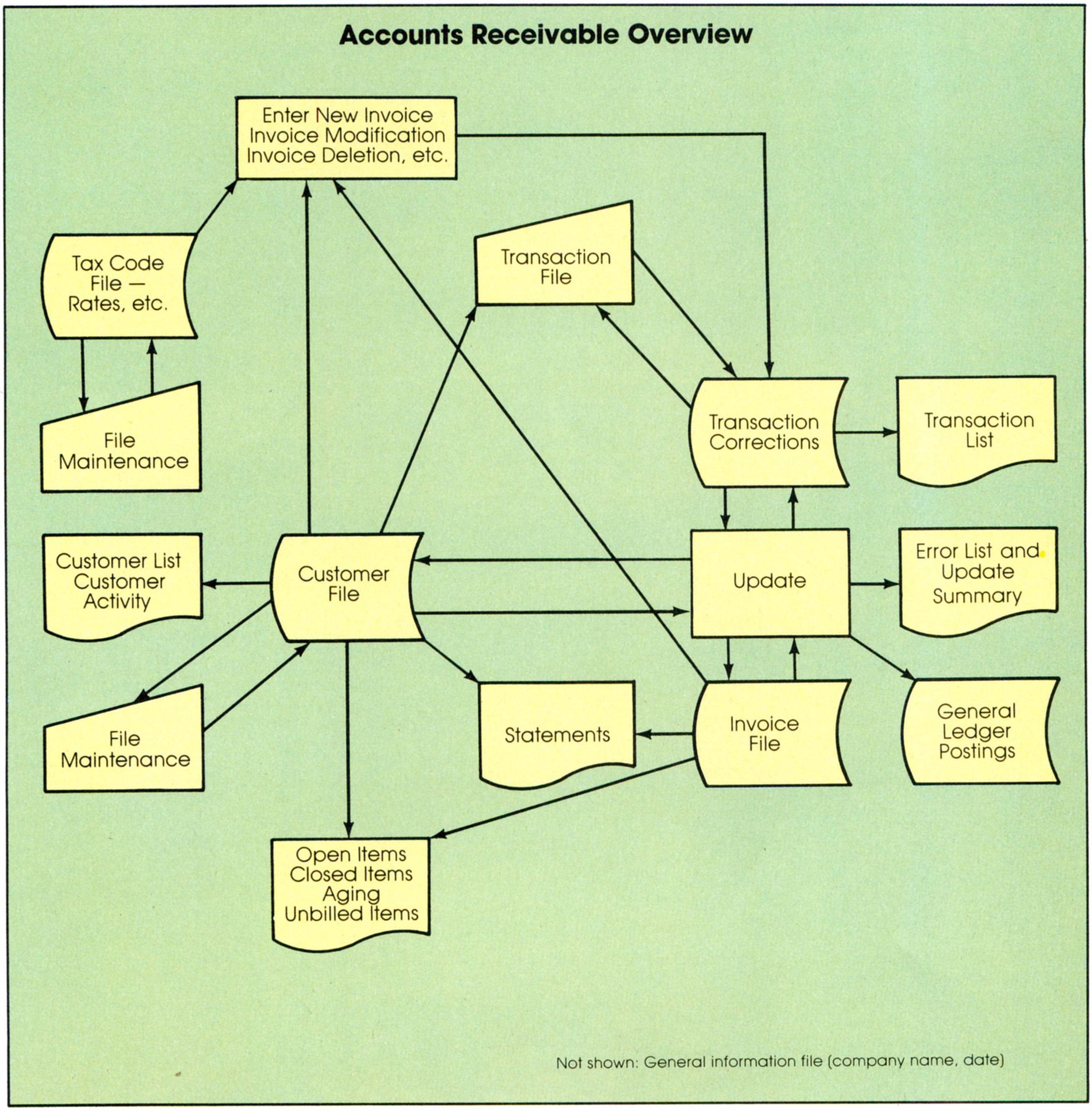
Business Enhancement Compuservice offers a limited although thoroughly integrated A/R as part of its Accounting IV package. It can hold 750 customers per diskette and is a strictly balance forward system. Its statements include current and aged balances and are among several that are arranged to be mailed in window envelopes.

BPI Systems, Inc. (distributed exclusively by Apple Computer, Inc.) sells an A/R that produces a detailed A/R ledger and skeleton GL for double-entry accounting. The current activity in the skeletal GL can be posted to any accounting system with one journal entry. It also interfaces with BPI's inventory package. It allows customized payment terms, prints mailing labels or allows for mailing with window envelopes, and prints past due notices.

BPI's account analysis feature allows for searching and sorting by any account, all accounts, past due accounts, past due year-to-date, and two finance charge analyses.

Computer Products International sells an A/R package that is exceptional in its sales analysis reporting. It prints a sales analysis by customer,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salesman, state or customer type. It also allows manual or automatic finance charge calculation, handles both BF and OI customers, and maintains a very detailed customer record.

Computer Systems Design, Inc. has an A/R package based on an OI system and is aimed at a distributor/wholesaler market. It generates six typical reports, including a cash receipts journal, an aged journal and statements. It also produces a department distribution report that allows division of receivables into 99 departments.

Cromemco A/R is the only package that handles bounced checks. It

Avoid The Business Computer Blues

Dudley Koontz of Cedar Rapids, IA, is a lucky man. He fell into several of the personal computer industry's worst "traps." He bought hardware from a company that went out of business; he bought his system from a computer retailer more than 1000 miles from his place of business; and he hired an expensive programmer to write custom software which, to this day, doesn't work right. Why, then, is he lucky?

Both he and the industry have come a long way during the past year. Today, Koontz is a very satisfied owner of a well-known hardware system, an accounts receivable package and other software packages that work well. He receives "diligent, reliable and competent" help from the software manufacturer and has few, if any problems with the hardware.

Direct mail business

Koontz first caught the personal computer bug in 1979 as he sought a way to handle small mailing lists on a microcomputer for his medium-sized direct mail business. "I had been using a service bureau, but mailing lists are valuable things, so I wanted all of mine under one roof."

He was "in despair" over his company's worsening accounts receivable situation. For years, Koontz used a complicated and inaccurate manual system which never balanced at month's end and he never had any way of finding out where the money went. So, he began searching for microcomputers in Dallas, TX, where he lived at the time. He bought a Polymorphic, canned software, and hired a programmer to modify the programs to fit his system.

"Needless to say, I have gone through an awful lot of grief. I made a lot of mistakes and did not listen to other people who warned me against buying a computer so far from the business," Koontz sorrowfully admitted. First, he found hardware bugs were almost impossible to fix because the store in Dallas could not service the machine. Second, the programmer botched the modifications and was never able to get the programs to run the way Koontz wanted them to. And third, Polymorphic went out of business, so, Koontz's bad situation got worse. He was now the proud owner of thousands of dollars worth of junk. His salvation came at a printing trade show. Three firms were selling mailing list software to run on Radio Shack TRS-80 Model II's.

Cutting his losses

Koontz bought a TRS-80 Model II, some mailing list software, and abandoned the system he had. His 64k Model II has three disk drives and a Line Printer III. He has received excellent support from Radio Shack, and in fact, the local store swapped an entire system because the model he bought was one of the first off of the assembly line and it would not work with one of his pieces of software.

Koontz then sought to solve his accounts receivable difficulties. "We were just not getting our aging reports done. The A/R was never in balance, and we could never find where the money went. In short, we were doing A/R in the most primitive way possible," Koontz said.

A pleasant surprise

Koontz turned to a new, small software house in Cedar Rapids called INFOSYSTECH, which had just developed an A/R program based on the original Peachtree version to solve his problem. "V.L. Ross at INFOSYSTECH has been the happy part of this experience," said Koontz. "He honors his word. He has made a number of modifications, improved the "cosmetics" on the screen and the way the screen menus read."

Koontz uses the software as a number cruncher and produces statements and aging reports (summary and detailed) for 500 customers, and about 400 to 600 invoices per month.

The crucial difference

Koontz is very pleased with his choice. "Before this, the system never ran satisfactorily. With INFORSYSTECH, I just turned on the system, put in the disk and away we went with no trouble at all." He taught one of his clerks how to use the basic software and enter the invoices in just a few hours. At the end of the month, he runs the aging print-out and other reports, and prepares the new disk for the next month in just a few hours.

The only trouble with the software has been of his own making: He wanted different categories from those that were offered with the program to compliment his own system and print out in fewer than 132 columns. Now Koontz is modifying the A/R software, the mailing lists, and is studying job cost programs to improve his cost control.

Koontz's experience, though all too typical with his tales of woe, can serve as an example. Buyers should take sound advice, deal with people who are reliable and competent, and use proven hardware and software. When mistakes occur, buyers should not give up in despair; they can learn from their mistakes and still gain the enormous benefits of a properly functioning microcomputer system.

also applies partial payments and generates 20 reports. The package uses actual double-entry accounting and automatically maintains a zero balance at all times. It integrates to the Cromemco G/L with a monthly summary.

Design Software's "Phoenix" A/R has been rewritten to allow both open item and balance forward accounting. It is one of the few programs that allows staggered billing dates and user-definable aging periods. It also maintains a 12-month sales history, previous 12 months' history and total sales from two years ago. Its data entry procedure uses fill-in the blanks and extensive error checking. It will verify account numbers against a current chart of accounts, maintain an invoice history file and keep invoice information until you run a selective purge.

Graham-Dorian's A/R is an open invoice, open item system that is based on Osborne software. It is parameter-driven and allows the user to set up the system according to his specifications. It can hold one 8-inch, single-density disk for up to 300 customers and 1000 open invoices.

Industrial Micro Systems (IMS) offers separate BF and OI packages. Both can hold between 750 and 1250 accounts depending on the number of transactions per month or open items per account, respectively. It provides for mailing in window envelopes, integrates to the IMS General Ledger, and will run on any 48k CP/M or MP/M based system.

INFOSYSTECH has modified the original Peachtree A/R with a license purchased from TCS in 1979. It will hold up to 1200 customers per disk, three times as many as the original version, with a double-density disk. Open item, BF, or "auto-billing" are available features. This package allows for printing statements on forms or on stock paper, and interfaces to a general ledger with a monthly summary. Full screen control and "help" screens are also available.

MBS/Cybernetics offers an A/R for microcomputers based on Mini-Computer Business Applications, Inc.'s RM/COBOL-based accounting system.

The package is an OI and/or BF system and provides user-definable credit terms, taxes and optional shipping methods. The open system provides an "open invoice work-

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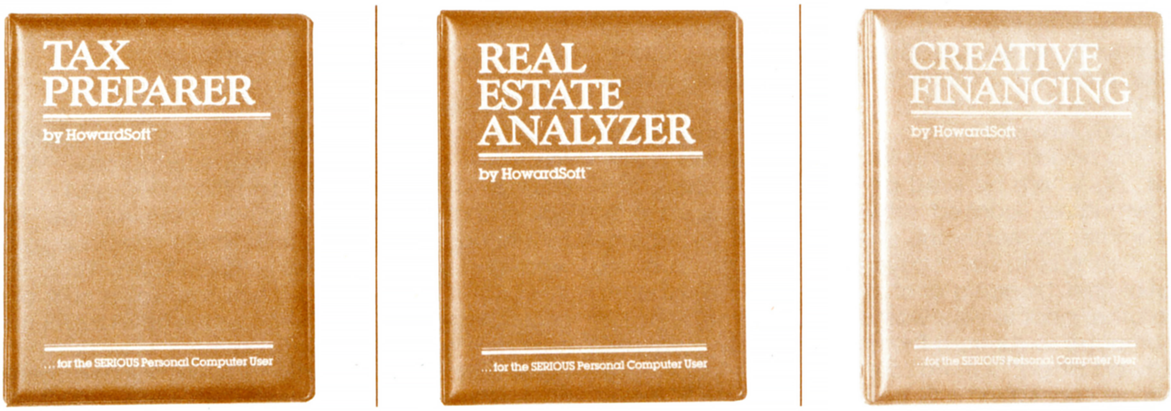
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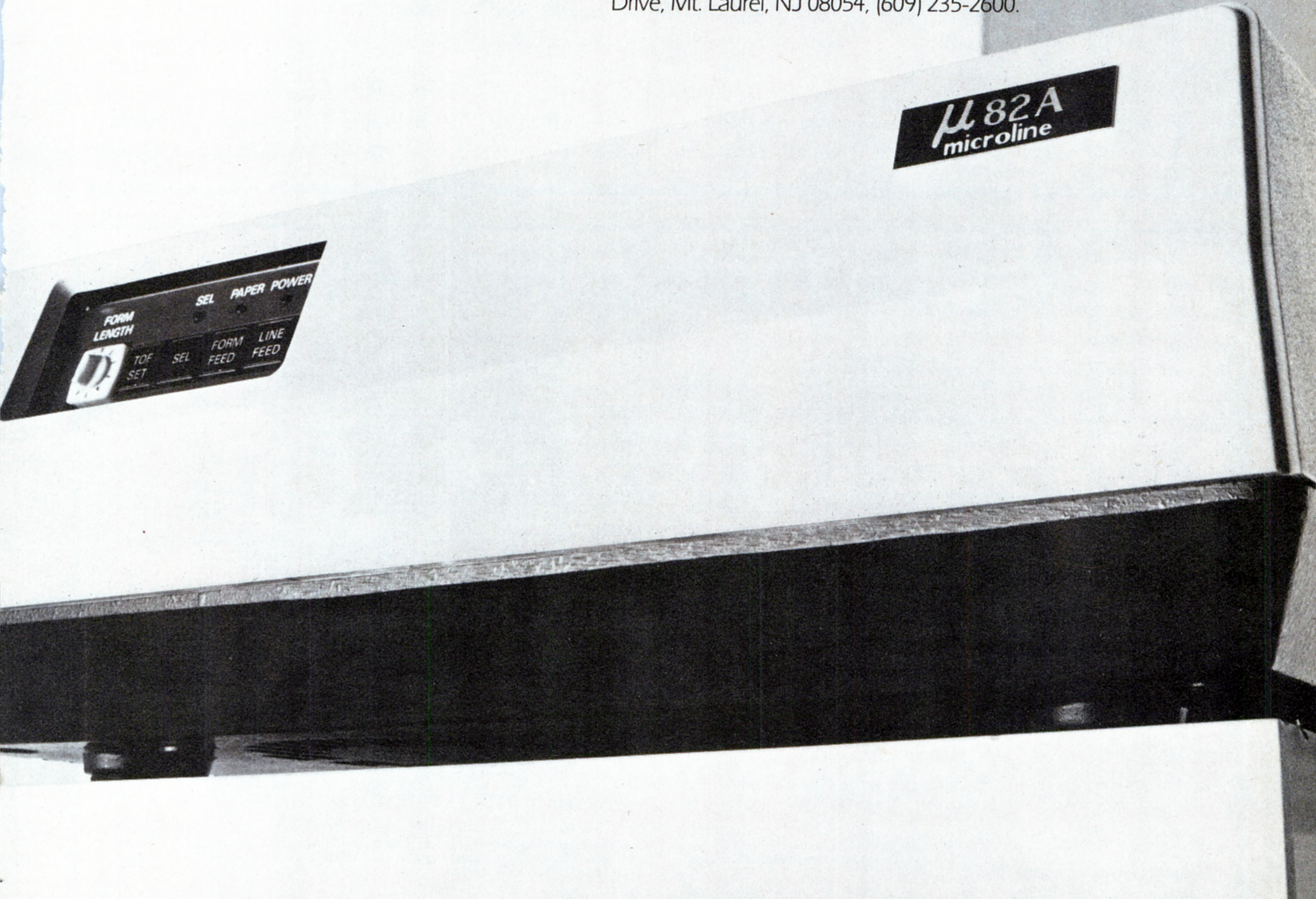
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sheet'' and statements can be printed in six different ways. It is the only package that publishes a sales commissions' due report.

Micro Architect's ACCT-III is also based on Peachtree Software's original version, but is designed to run on TRS-80 Model Is and IIIs with at least 32k RAM. It has a batch report function that prints up to three reports without user input and a ''shell'' sort feature that sorts names.

Microsource's LedgerPlus A/R is one of the few to use an alphabetical listing of accounts, produce a sales report by either salesman's name or by sales outlet, and works as a balance forward system. It integrates to the LedgerPlus General Ledger.

North Star ACCPAC A/R integrates with ACCPAC G/L and accounts payable. It can handle up to 1500 accounts on a three-diskette system. It works as a balance forward or open item system on a customer-by-customer basis and stores credit limits, year-to-date sales, and last year's sales as well as standard information for each customer. Its report generator lets the user define some formats, such as aging reminders, over-limit reminders and so forth. It also keeps a journal of interest charges and prints changes when they are made.

Radio Shack A/R has a very versatile finance charge function which allows you to establish ''breakpoints'' for finance charges. It allows the user to apply different finance charges to the same account depending on the amount owed. Suppose you charged 1.5 percent interest below $250, and 2 percent above that figure. This system is the only one that lets you initialize the system that way. It also offers six types of aged trial balances: no aging with or without detail; aging with detail or without; and aging with detail and update, or without update.

Retail Sciences' Peachtree Software A/R prints control reports during transaction entry. The Vector Graphic version has been changed to run with its hardware.

Small Business Computer Systems offers a limited A/R program based on its overall double-entry general accounting package.

Structured Systems A/R works as a BF or OI system and integrates to its G/L with monthly summaries. In addition to a range of reports and statements, it produces reminder notices and has many features designed to make the package crashproof with extensive error-checking.

Systems Plus AccountingPlus' A/R operates only as an OI system,

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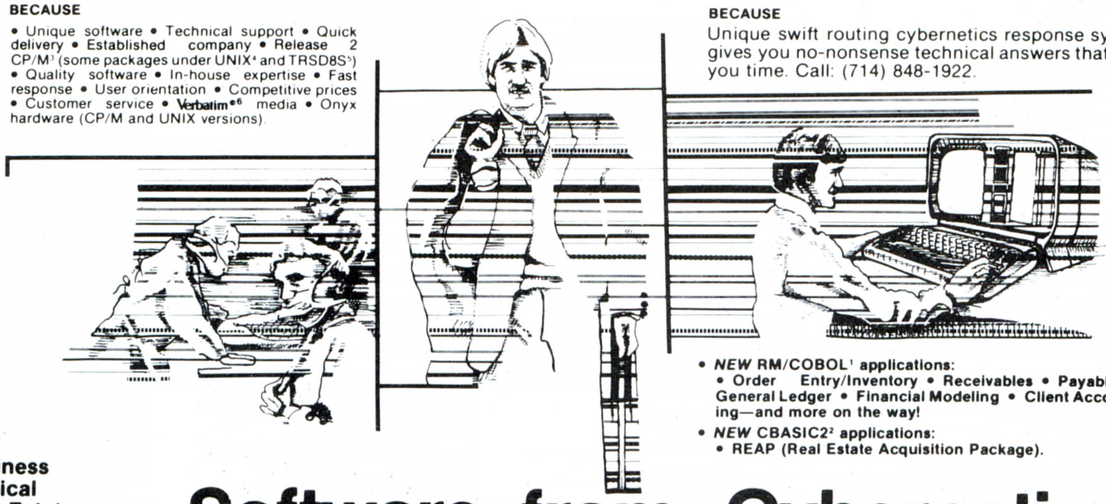

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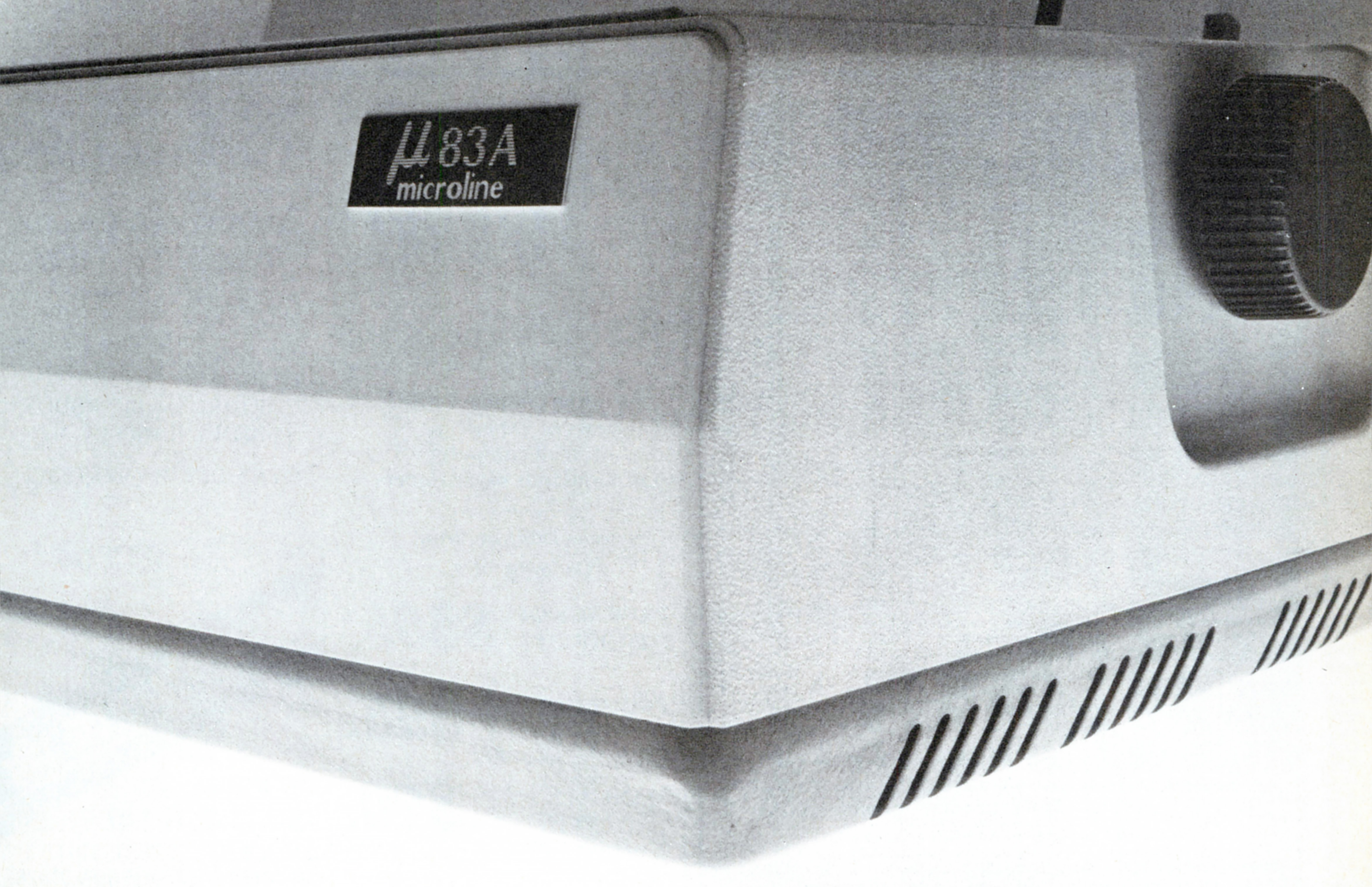

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and integrates to both general ledger and invoicing/billing programs. If you use the order entry package with it, the A/R is automatically continuously updated without user input. It also automatically posts transactions to G/L, provides complete audit trails, and produces an A/R distribution to G/L report at month end to make sure they balance.

Taranto Associates' A/R is a balance forward system. It is not invoice-oriented and it treats each transaction as a separate item. A mailing and shipping label routine with alphabetic or zip code sequencing is also included.

Conclusion

Curious users should be aware that they will have to make compromises with their current requirements to find an A/R package that will help them keep track of the most essential ingredient of doing business—cash. Above all, consumers should not fall into the trap of buying an integrated accounting system with five or six packages just to save a few dollars. All consumers should be sure they know what they plan to do with all of the packages before they buy them. At least, you won't have to face useless programs lying on a shelf.

ACCOUNTS RECEIVABLE VENDOR GUIDE

Company	Name/Cost	Configuration/Capacity
American Business Systems 459 Littleton Rd. Westford, MA 01886	Accts. Receivable $700–900	Any 64k Z80 or Z8000 micro with Ryan McFarland COBOL and RIO, CP/M, OASIS, UNIX OR TI DX5 or 10 operating system, and two 8-inch floppies or hard disk. Minimum capacity: 750 customers; 1500 open invoices; 25 transactions/day with a single-sided, single-density system. **CIRCLE 170**
APF Electronics 1501 Broadway New York, NY 10036	Accts. Receivable $199	APF Imagination Machine (I or II), with dual disk drive and 80-col. printer, with their interfaces and 8k or 16k RAM module. Capacity: 304 accts. per disk. **CIRCLE 171**
Business Enhancement Compuservice 1711 E. Valley Pkwy. Suite 109 Escondido, CA 92027	Accounting III or IV—Accts. Receivable/Cost set by dealers	32k PET or CBM 2001–8032, or 2040–4040. 750 accounts per diskette, transactions up to disk capacity. **CIRCLE 172**
BPI Systems, Inc. 1600 W. 38th St. Suite 444 Austin, TX 78731	Accts. Receivable (distributed exclusively by Apple Computer)	48k Apple II or II Plus; two disk drives; AppleSoft; DOS 3.3; printer. Capacity set by disk size and density. **CIRCLE 173**

continued on page 88

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	TI787 Portable KSR, 120 CPS	2,845	273	152	102
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TELEVIDEO	920 CRT Terminal	895	86	48	32
	950 CRT Terminal	1,075	103	57	39
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	Letter Quality, 55/25 KSR	3,295	316	175	119
QUME	Letter Quality KSR, 55 CPS	3,395	326	181	123
	Letter Quality RO, 55 CPS	2,895	278	154	104
HEWLETT PACKARD	2621A CRT Terminal	1,595	153	85	58
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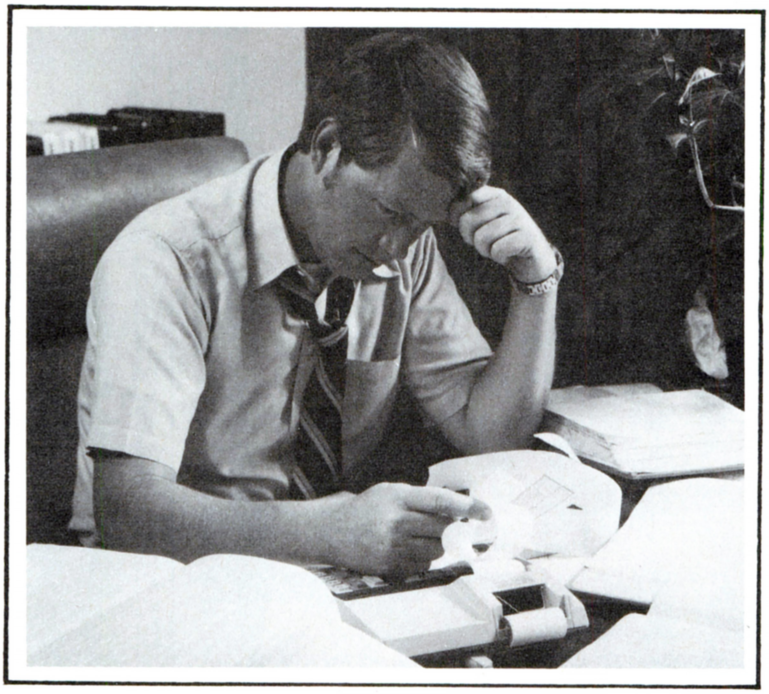

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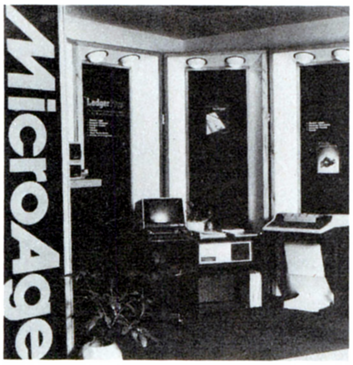

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CIRCLE 52

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ACCOUNTS RECEIVABLE VENDOR GUIDE

Company	Name/Cost	Configuration/Capacity
Computer Products International, Inc. 3225 Danny Park Computer Plaza Bldg. Metairie, LA 70002	Accts. Receivable Cost N/A	Any 48k CP/M system with CBASIC, and two disk drives. Capacity limited to disk space. **CIRCLE 174**
Computer Systems Design P.O. Box 735 Yakima, WA 98902	Accts. Receivable Cost set by dealer	Radio Shack TRS-80 Model II, any ALTOS system, and IBM Models 32, 34, 5110 and Series 1. Capacity set by system size. **CIRCLE 175**
Cromemco, Inc. 280 Bernardo Ave. Mountain View, CA 94040	Accts. Receivable $995	Runs on any Cromemco system with double-sided, double-density mini- or regular floppies. Capacity: hundreds of accounts and thousands of transactions per disk. **CIRCLE 176**
Design Software 3400 Montrose Blvd. Suite 718 Houston, TX 77006	Palantir Accts. Receivable $850	Any 48k CP/M system with two disk drives or hard disk and Microsoft COBOL-80. Capacity depends on disk size. **CIRCLE 177**
Graham-Dorian 211 North Broadway Wichita, KS 67202	Accts. Receivable $595–805	48k CP/M with two floppy disk drives. Up to 300 customers and 1000 open invoices on one 8-inch floppy. **CIRCLE 178**
International Micro Systems, Inc. 8425 Quivira Rd. Lenexa, KS 66215	Accts. Receivable $795	48k CP/M or MP/M systems with dual floppies or hard disk and CBASIC 2. 500k recommended. Balance Forward and Open Item are separate programs. **CIRCLE 179**
INFOSYSTECH ATTN: V.L. Ross 4601 Deerview Rd. N.E. Cedar Rapids, IA 52401	Accts. Receivable $349.95 (Based on original Peachtree version)	TRS-80 Model II, 64k, two disk drives, Pickles & Trout CP/M ($185). Capacity: 1200 customers max. **CIRCLE 180**
Micro Business Software Cybernetics, Inc. 8041 Newman Ave. Suite 208 Huntington Beach, CA 92647	Accts. Receivable Dealers set price based on licenses	MBS RM/COBOL, OASIS with 64k RAM, 24 x 80 CRT, 132-col. printer, three floppies with 1/2 Mb. each minimum. Ideal is 10 Mb. hard disk. **CIRCLE 181**
Micro Architect 96 Dothan St. Arlington, MA 02174	ACCT–III Accts. Receivable $99.95	32k RAM min., TRSDOS, dual disk drives, 80- or 120-col. printer, TRS-80 Model I or Heath 8 or 89 with HDOS. Capacity: 250 accounts and 2500 transactions of 25 characters each. **CIRCLE 182**
Microsource 1425 W. 12th Pl. Tempe, AZ 85281	LedgerPlus Accts. Receivable Price dealer set	48k Apple, Vector Graphic or TRS-80 with Micropolis disk drive, VDT, dot matrix printer. Capacity: Set by disk size and density. **CIRCLE 183**
North Star Computers 1440 Fourth St. Berkeley, CA 94710	ACCPAC Accts. Receivable Cost N/A	North Star Horizon, 48k, dual floppies or hard disk. Up to 1500 customers with three diskettes. **CIRCLE 184**
Radio Shack One Tandy Center Fort Worth, TX 77062 (or any Computer Center)	Accts. Receivable $399	64k TRS-80 Model II with two floppy disks and Line Printer III. Capacity not available. **CIRCLE 185**
Peachtree Software Vector Graphic, Inc. 31364 Via Colinas Westlake Village, CA 91362	Peachtree Software Accts. Receivable (Vector Graphic version) $495–535	CP/M 2.2 version, 56k RAM, Vector Graphic MZ, 3030 or System B microcomputer, and Microsoft Disk BASIC. Max. capacity: 600 customers per diskette. **CIRCLE 186**
Small Business Computer Systems, Inc. 4140 Greenwood Lincoln, NE 68504	Accts. Receivable $249; new enhanced version is $349.	48k Apple II or II Plus, dual disk drives or hard disk; 110-col. printer; and DOS 3.2 or 3.3. Capacity relates to number of customers and invoices. **CIRCLE 187**
Structured Systems Group 5204 Claremont Oakland, CA 94618	General Ledger $595–695 sugg. dealer price	Any 8080- or Z80-based, with 56k RAM, with CP/M, dual floppies; 132-column printer. Capacity: 26,000 customers; 4000 invoices per diskette; 999 customers per month; 150 invoices per customer. **CIRCLE 188**
Systems Plus 3975 E. Bayshore Palo Alto, CA 94303	AccountingPlus II Accts. Receivable $425	Apple II Plus or II with firmware card, 48k, dual drives, and 80- or 132-col. printer. Also Corvus hard disk. Up to 300 customers. **CIRCLE 189**
Taranto & Associates P.O. Box 6073 San Rafael, CA 94903	Accts. Receivable $495–695 dealer prices.	TRS-80 Model II, 64k, two disk drives, 132-col. printer with up to 2000 customers and 11,000 transactions/month. (Osborne-based system) **CIRCLE 190**
VANDATA 17541 Stone Ave. N. Seattle, WA 98133	Accts. Receivable $295	Any 8080, 8085, or Z80 system with 48k; one double-density floppy or three mini-floppies for the best results; 132-col. printer; and CP/M and CBASIC Version 2.5 or later. Osborne-based with significant changes. Capacity governed by disk size and density. **CIRCLE 191**

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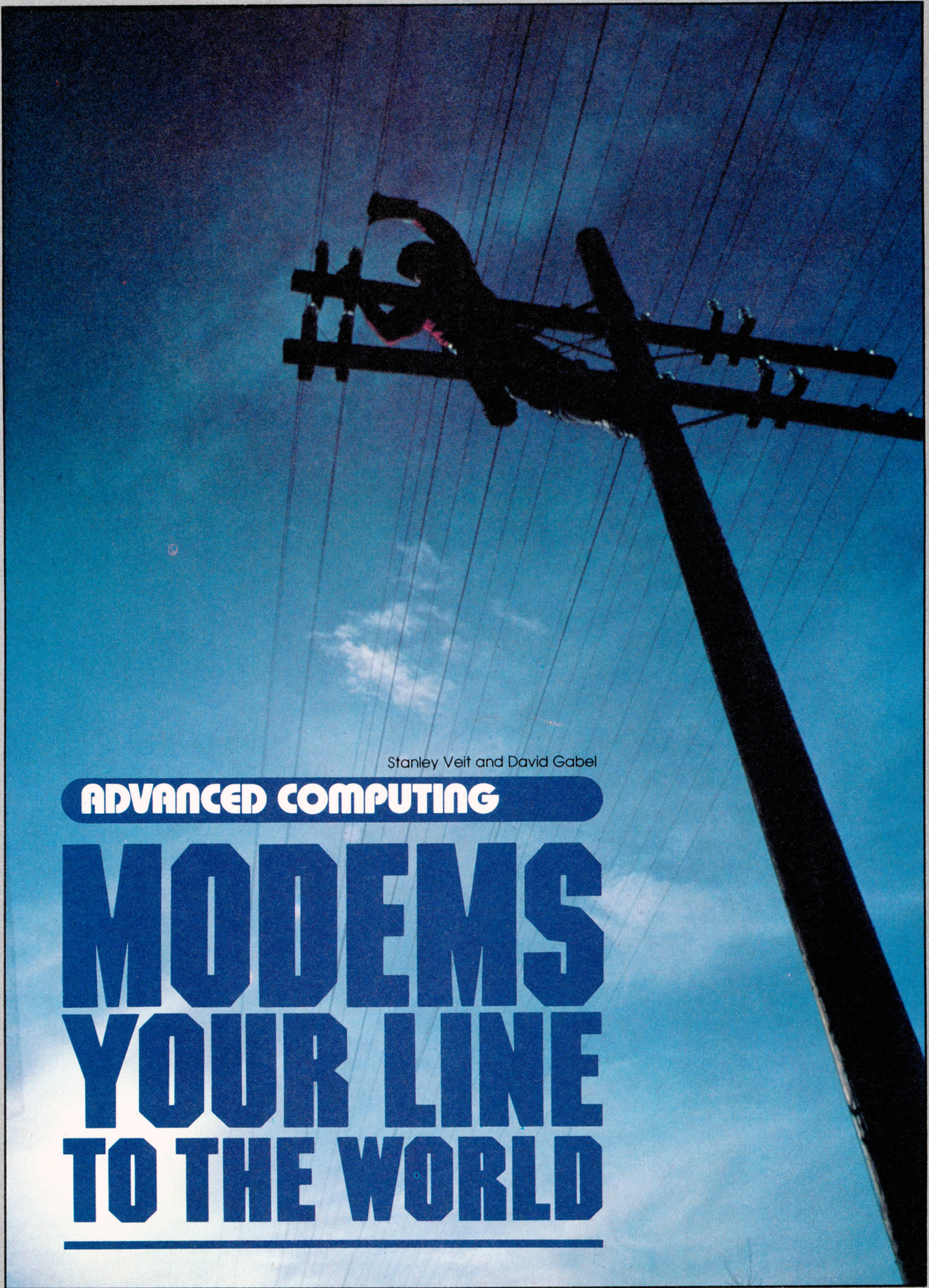

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Stanley Veit and David Gabel

ADVANCED COMPUTING

MODEMS YOUR LINE TO THE WORLD

Telephone lines are needed to move data any appreciable distance. And modems are needed to put the data onto the line.

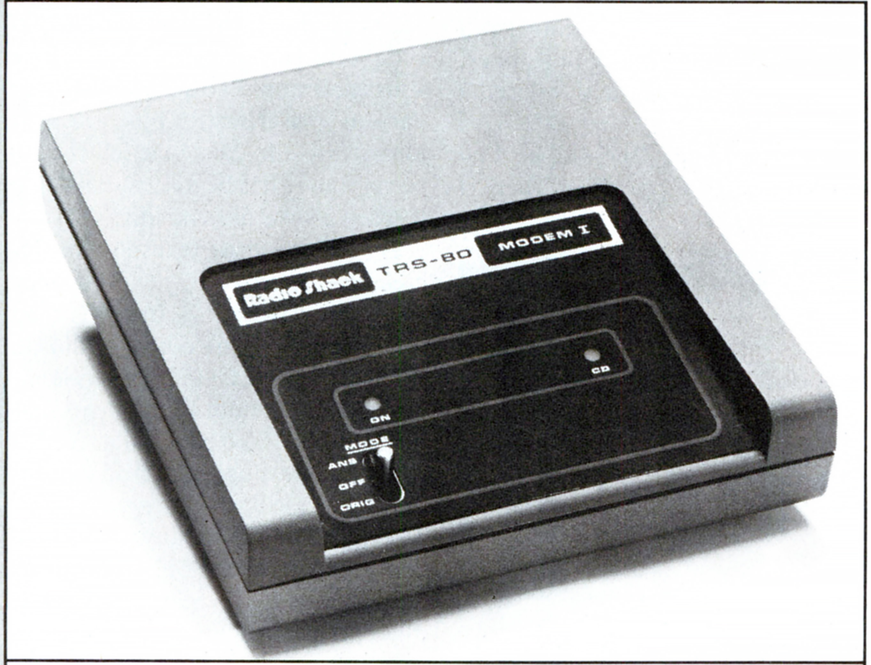
Telecommunications, or more narrowly, data communications, is a forbidding term. It can conjure up visions of amazing possibilities for the sophisticated user of personal computers. But it can also leave a very large blank in the mind of the not-so-sophisticated computerist.

And that's really too bad, because the whole of the data-communications universe is perhaps one of the most exciting touched upon by the personal computer. If one asks, "But what else can I do with my personal computer?" (after all the personal and institutional record-keeping and analysis applications are exhausted) the answer is clear. One can talk to the rest of the world with the computer. Information is available from a variety of data banks. Information can be sent to others with similar interests through the use of many bulletin boards around the country. Stock information, or the national wire services are available.

The personal computer opens up the world of information to its user.

If the personal computer is properly equipped. And that means it must have a modem and some communications software. Or it must have a modem and access to one of the several data banks operating across the country.

Fortunately, that's not all that impossible. Fortunately, that's not too difficult. Personal-computer manufacturers are now providing the means to get onto the information nets with modems that connect to the personal computer in a matter of minutes, and they are providing software that will automatically dial the number of one or more of the various services that provide the user with more information than he (probably) ever wanted to know.



The Modem I from Radio Shack. Full duplex, direct connect for a very low price.

Enter Mr. Bell

If you are going to be transmitting more than a very short distance (short being, say, within a building) then there is no sidestepping the need to hook up with the telephone system. Bell has the lines in place for communications around the country and around the world. So at some point access is required to the public telephone network for long-distance communications.

It is well known, although probably not much thought about, that the phone system is a voice system. Until recently, the principal use for the telephone was conducting voice transmissions. That is beginning to change as more computers are being put on-line.

But since the phone system is a voice system, it isn't particularly suited for use by computers. The human voice exists at quite a low frequency. A good hi-fi set will have a bandwidth from 20 to 20,000 Hz. That means it will accurately reproduce signals varying at frequencies between those two limits, and they include all human voice. But computers can operate, typically, 100 times faster than the highest range of a hi-fi set. That's too fast for the telephone network, which in addition to being low-frequency to accommodate voice transmissions, is also band limited, for economy. When people talk on the telephone, their voices are not as rich sounding as they are in person. This is because the phone lines limit the frequencies that are transmitted to between 30 and 3000 Hz. (Remember the hi-fi bandwidth.) So voice loses many of the overtones that give it a rich timbre.

Bits on the line

Other signals can experience losses too. In fact, it just isn't possible to put high-speed digital information onto the phone lines without modifying that information. The modification is done with a modem.

Modem stands for *Mo*dulator/*dem*odulator. It impresses the digital information we wish to send onto a signal that can be transmitted down the line. Another modem recovers the digital information at the other end of the line. Modulation is this process of impressing information on a signal.

The simplest types of modulation are amplitude modulation, in which the size of the varied signal (the carrier signal to use the engineering term) is changed according to the information, or modulating signal; frequency modulation, in which the frequency of the carrier is changed by the modulating signal; and phase modulation, in which the position of the zero point of the carrier wave is shifted away from the origin of an arbitrary set of coordinates. The amount of the displacement or shift, then, is a function of the modulating signal.

Most of the modems with which the personal-computer user will likely come in contact are simple, low-speed, asynchronous devices. Most of these employ frequency modulation referred to as Frequency-Shift Keyed modulation (FSK). In this technique, the frequency of a carrier is changed from its normal state to some other frequency to indicate the presence of a 1 or a 0 on the line. The tones generated by this kind of modem can be heard if one is listening to the telephone line over which a message is being sent. It will sound exactly like two audible tones, which is, of course, exactly what the message is.

These modems operate at low speed for two reasons. First, there is a limitation on the speed at which the phone company's lines can accept data. Above 1200 baud (a baud is one signal element per second) the telephone line must be a conditioned line—one that has been specially prepared for the transmission of digital data.

LYNX
TELEPHONE LINKAGE SYSTEM
POWER
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EMTROL SYSTEMS INC.

The latest from ESI Lynx can run with the TRS-80 Model I and III. It features auto dial and auto answer modes.

The fact that these modems operate asynchronously limits their speed also. Asynchronous operation means that the transmitting terminal equipment and the receiving terminal equipment have no idea when either has started operation. They are operating at their own rates. So the receiver must know when a byte starts and stops. To accomplish this, various "overhead" bits are sent along with the data that tell the receiver a byte has begun, and also tell it when a byte has ended.

As the speed of transmission increases, the space in the frequency spectrum devoted to the overhead bits increases. This puts a strain on the bandwidth of the phone system. The real upper limit for modems that use FSK is 1800 baud, but for all practical purposes, personal-computer users will never see this speed. The telephone company requires a conditioned line for operation of its 202 data set (the Bell name for a modem) at 1800 baud. It's doubtful that the average user of the personal computer will use anything other than voice-grade lines, simply be-

A new offering from Bizcomp, the Model 1080, can be used at 300 baud and below.

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- Basic Language
- Cobol Language
- Cross Assemblers
- Fortran Language
- RPGII Compiler
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- Collectors/Collections
- Consumer Issues
  - Behavior
  - "Consumer Question Box"
  - Consumer Reports
  - Credit
  - Credit Cards
  - Protection
- Decorating & Design
  - Antiques
  - "Decorating"
  - "Interior Decorating"
  - Painting & Decorating
- Food & Cooking
  - "Food"
  - Food Additives
  - "Slim Gourmet"
  - Trading of goods & services
  - WINE (31 separate listings)
- "Growing Older" (advice)
- Health Care Advice
- Home Repairs
  - Energy Savings
  - "First Aid for Ailing House"
  - Hardware
  - Solar Energy
- Inventions & Inventors
- Shopping & Trading
  - Bartering
  - Catalog (of goods)
  - Discounts
  - Equipment, Lease vs Purchase
  - "Family Shopper"
  - Generic vs Brand Names
  - Joining a Merchandise Service
  - Merchandise
  - Money Savers
  - Premiums, Coupons
  - Price Quotes
  - Shopping at Home
  - Trading of Goods & Services
- Office Equipment
- Software
- Toll-free Numbers (over 90 listed)
- **CURRENT NEWS**
- Anderson, Jack
- Domestic News
- Foreign News
- International News
- National News
- News (50 states)
- New Focus
- News Summary
- Tomorrow's News Today
- United Press International
- United States Nat'l News
- **EDUCATION**
- Addition
- Aid, Financial for College
- Aphorisms
- Art Objects
- Arts
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- English Lesson
- Esperanto Lesson
- French Vocabulary Drill
- Geometry Lesson
- German Adjectives
- German Vocabulary Drill
- Gifted Students
- Grammar (story fun)
- Greek Root Exercises
- Information on Demand (Research)
- Italian Vocabulary Drill

- Translation Services
- Writing & Writers
- Wisdom of the Ages
- **ENERGY**
- Gasoline Rationing
- Energy (22 savings subjects)
- Nuclear Wastes
- Regulatory Agencies
- Solar Energy
- Synthetic Fuels
- **ENTERTAINMENT/HOBBIES**
- Absurdity
- Aces on Bridge
- Adventure
- Amusement
- Arts
- Astrology
- Cinema (reviews)
- Collectables
- Collectors/Collections
- Computer Conferencing
- Dating
- Drawings
- Hobbies
- Horse Racing
- Humor
- Marriage Analysis
- Mockridge, Norton
- Movie Reviews
- Music
- Photography
- "Pop Scene"
- Previews (TV)
- Q & A (TV)
- Satellite TV
- Science Fiction
- Sewing
- Sounds (rock)
- Single Persons
- Soap Operas
- SOURCEWORLD Magazine
- Stereo/TV
- "Stitch-N-Time" (sewing)
- Television—Features, Previews, Quiz
- Time of Your Life (Aging)
- Unidentified Flying Objects
- Video
- Wines
- Words, Wit & Wisdom
- "Wry Comment"
- **GAMES & TRICKS**
- Ace—(trick)
- Backgammon
- Blackjack
- Bridge
- Card Tricks
- Casino 21
- Checkers
- Chess
- Children's Programs
- Civil War (game)
- Coin Flipping
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- Fill in Letters (game)
- Flip
- Foot (game
- Golf
- Gues mputer umber
- Han n (word g)
- Ho (game)
- I-Ching
- Intelligence Test (game)
- IQ Test (game)
- Joker (trick)

- Poker (game)
- Posters (game)
- Puzzles
- Rocket Game
- Rule Sumeria (game)
- Score Four (game)
- Selling Product (game)
- Sinners (game)
- Slot Machine (game)
- Sonnets (game)
- Statistics (date game)
- Star-Trek (game)
- Target Practice
- Tic Tac Toe (game)
- Tic Tac Toe in Spanish
- Toro (bullfight game)
- Tricks
- Vegas (game)
- Wumpus Hunt (game)
- **GOVERNMENT**
- Anderson, Jack
- Armed Services
- Arms Control
- Business Role in Politics
- Census
- Democratic Nat'l Convention
- Equal Rights Amendment
- Federal Revenue Sharing
- Intelligence Services
- Issue and Debate
- Labor & Management
- Labor & Politics
- Lobbying & Lobbyists
- Loftan, John
- Medicare
- Metric System
- National Health Insurance
- Political Action Report
- Population—Vital Statistics
- Postal Service
- Presidential Elections (1980)
- Privacy
- Regulatory Agencies
- Republican Nat'l Committee
- Social Security
- Taylor, Henry
- U.S. Population Stats
- Veterans
- Volunteer Military
- Washington, D.C.:
  - Capitol News Service
  - Editorial Summary
  - Emergency Numbers
  - "Everything Else"
  - Hotline
  - House Committee Hearings
  - Meetings, Conferences
  - People, Places, Things
  - President's Schedule
  - Senate Committee Hearings
- Whistle Blowers
- **HEALTH**
- Abortio
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  - For Women Only
  - Nervousness & Nerve Problems
  - Poisons

- National Health Insurance
- Obstetrics
- Pregnancy/Maternal
- Saccharin
- Sleep
- Therapy for Addicts
- Transplants
- Vitamins
- **LAW**
- Cases Accepted
- Cases Refused
- Fair Trial vs Free Press
- International Law
- Legal Profession
- "What's the Law"
- White Collar Crime
- **REAL ESTATE/HOME:**
- About Real Estate
- "Aid for Ailing House"
- Amortization of Loans
- Amortization of Loan, UNK Term
- Apartments (rent)
- Home:
  - Ailing
  - Buying
  - Decorating
  - Loans
  - "Household Hints"
  - Selling
- Interest, Loan
- "Interior Decorating"
- Loan:
  - Installment Interest
  - Amortization, UNK Term
  - Amortization Schedule
- Malino, Emily (home decorating)
- Mortgage Analysis
- Moving Plans
- Painting & Decorating
- Property for Rent
- Property for Sale
- Property for Swap
- Property Wanted
- Real Estate
- **SCIENCE & TECHNOLOGY:**
- Advanced Applications/Programs
- Aircraft
- Amperage
- Angle, Quandrant Ref
- Base Conversion
- Bessel Function (statistics)
- Binomial Coefficients (statistics)
- Binomial Probabilities (statistics)
- Chi-Square (statistics)
- Circular Path Speed
- Cloning
- Coefficients, Binomial (statistics)
- Commands
- Coordinates (polyhedra; statistics)
- Correlation Coefficient (statistics)
- Cross Assemblers
- Data Computation (statistics)
- D nina
- D sion sures
- E c Ve s
- E ical E heerin
- E eeri
- Exobiology
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- Fall ta (sta ics)
- Filte or es (statistics)
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- Genetic Engineering
- Greatest Common Denominator
- Greek Root Exercise
- Ham Radios

- Molecule Thickness
- Motion Graphs
- Nuclear Wastes
- Ohm's Law (statistics)
- Parabola Graphing (statistics)
- Perfect Number?
- Personal Computers
- Pet Computers
- Poison (statistics)
- Pollutants
- Primes (statistics)
- Probabilities (statistics)
- Programming Manuals
- **SUBSCRIBER COMMUNICATION**
- Advertising (personal classified)
- Announcements (from The Source)
- Apple Computer Information
- Bulletin Board
- CHAT (direct communication)
- Clubs
- Computer Conferencing
- Contents of The Source
- Correspondence
- Dating
- Express
  - (sends letters with express alert)
- Gripes (about The Source)
- Help Wanted
- Mail
- Personal Calendar & Notebook
- Services
- Suggestions (for The Source)
- User Directory (for The Source)
- Users On-Line
- **TAXES**
- Assets
- Calculation of Income Stmt
- Capital Gains Tax
- Computing Taxes
- Contributions
- Credits
- Debts
- Deductions
- Dependents
- Depreciation Schedule
- Donations
- Expenses
- Income Statement, Pro Forma
- Income Tax
- Joint Tax Filing
- Taxes
- **TRAVEL & LEISURE**
- Airline Schedules
- Airline Toll-Free Numbers
- Alert (astrol/travel)
- Bargains (travel)
- Car Rentals (toll free no.)
- Climate (geography)
- Customs (tariff)
- Dining Out
- Fairs & Festivals
- Flight Reservations
- Fli Sc les
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- Sk esort oll nos
- Smithsonian Exhibits
- Tour Packages
- Travel Plans
- Vacation Specials
- Weather
- Weekend-Getaway
- **SPORTS**
- Baseball
- Basketball
- Box Scores (sports)
- Football

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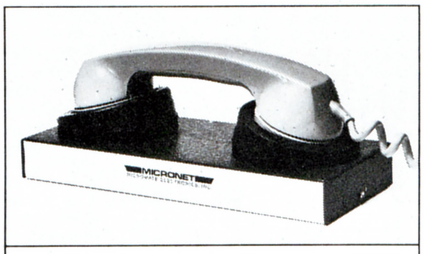
CIRCLE 54

cause the conditioned lines are expensive, and not readily available to the average telephone set.

Three hundred baud sounds pretty fast, but it really isn't. Remember that a baud is the time required for the transimssion of one signal element. Signal elements are bits, and it takes at least 7 bits in ASCII (American Standard Code for Information Interchange) to make up a character. Add the overhead bits, and that 300 baud turns out to be about 10 characters/second. People who have worked at that speed can testify that it's very slow. To increase speed, the modem has to employ phase modulation, in a technique referred to as phase-shift keying.



Micronet Electronics offers a number of modems, including this acoustic coupler and direct-connect modems.

Phase-shift keying actually can encode two bits per baud by phase shifting the carrier wave to any of four positions depending on the value of the bit pair (called a dibit). If for example, the dibit presented to a Bell 201 modem is 00, the modem will shift the carrier 45 degrees from the zero point. A 01 displaces the wave 135 degrees, and so forth. So if a modem like this is operating at 300 baud, it is transmitting information at 60 characters per second—twice as fast as was the simple FSK modem. Other modems that use phase-shift keying operate much faster. In fact, Bell can provide, for a price, modems that operate as fast as 9600 bps. These modems can cost as much as ten times the price of a Bell 103, 300 baud modem, however.

Users of personal computers will, in all probability, not be interested in data communications until the price drops dramatically. Until that time, there is little incentive for a personal-computer owner to spend the money when he can afford to wait a little longer for the data transmission. With most readers, the choice is limited to the capabilities available at 300 baud.

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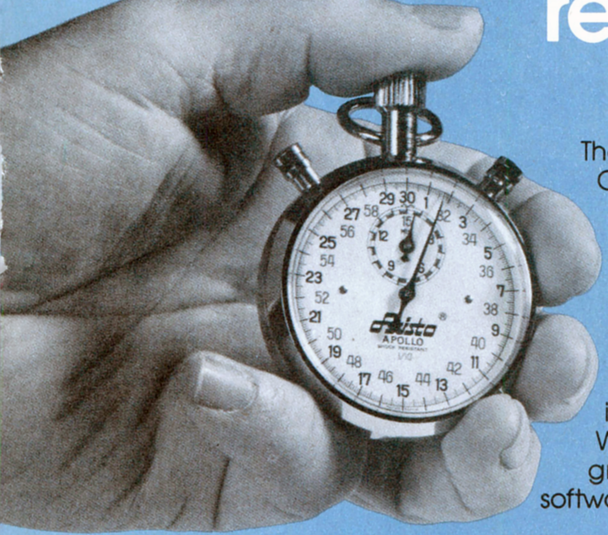

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speed, there are still choices to be made. The first, a dial-up modem or dedicated line, is easy. In almost no circumstance will low data volumes require a dedicated line. The phone company charges very healthy fees for such an arrangement. So most users will opt for dial-up modems. These devices operate as the name suggests—the user dials the number of the receiving data terminal equipment he wishes to reach. Data are fed from his computer to the telephone he used to make the connection. At the termination of the session the transmitting station terminates the connection by simply hanging up the phone. It's simplicity itself.

Still there are differences in modems. They can be full- or half-duplex. This describes the direction of data flow. A simplex modem will have information flowing from it or to it, but not both. In actual practice, any modem acts like a simplex modem at times.

The real world

But the modems of interest to the

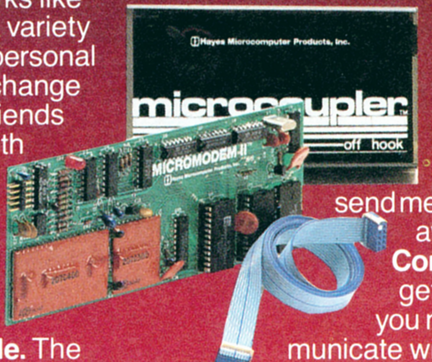
POPULAR PERSONAL-COMPUTER MODEMS

NAME	MANUFACTURER	TYPE	APPLICATION	PRICE	FEATURES
ATARI 830	Atari Computer Div. 1196 Borrego Ave. Sunnyvale, CA 94086	Acoustic coupler	Atari 400 Atari 800	$200	Requires Atari 850 Interface Module. **CIRCLE 205**
CAT	Novation Inc. 18664 Oxnard St. Tarzana, CA 91356	Acoustic coupler	Any computer or Terminal	$189	Originate/answer 300 baud.
D-CAT		Direct connect modem	Same as above	$199	Originate/answer, direct connection modem.
APPLE CAT		Plug into bus, auto-answer, originate programmable modem	Apple II	$390	Plugs into Apple II bus, originate/auto answer controlled from keyboard, or program. Includes full duplex serial port with handshaking for printer operating at 1200 baud. **CIRCLE 206**
CHATTERBOX	Micromint 917 Midway Woodmere, NY 11598	Acoustic modem with RS-232-C interface and printer port	TRS-80	$279.95	300 baud originate modem. Centronics printer port RS-232-C port (50 to 19.2k baud.) Connects to TRS-80 keyboard, or expansion interface. Includes software. **CIRCLE 207**
LEX-II	Lexicon Inc. 8355 Executive Center Dr. Miami, FL 33166	Acoustic coupler	Any computer or Terminal	$159	300 baud acoustic coupler modem. Switch selectable originate/answer modes. Has battery-powered option for portable operation. **CIRCLE 208**
LYNX	ESI-Lynx 123 Locust St. Lancaster, PA 17602	Direct connect telephone link with RS-232-C interface.	TRS-80 Mod I Mod III Apple II	$279.95	Telephone linkage for TRS-80 Mod I, II, III with or without expansion interface. No RS-232-C interface required for operation. Software supplied. Mounts under telephone. **CIRCLE 209**
MICRO-connection	The Micro Peripheral Corp. 2643 151 Place NE Redmond, WA 98052	Direct connect with interface	TRS-80	$249	Connects to TRS-80 without RS-232-C Interface board. Also includes 300 baud serial-printer port. Includes SMART III or SMART-80 terminal program for Mod I, III. Auto dial/auto answer module available for $79.95.
ATARI connection		Same as above	Atari 400, 800		ATARI Connection used with Atari 400, or 800 without Atari Model 850 Interface. **CIRCLE 210**
RS-232-C connection		Same as above	Any computer		
MICRONET	Micronet Electronics 2094 Front St. East Meadow, NY 11554	Direct connect modem with intelligent FIFO memory	Apple II	$289	Connects to game paddle I/O socket in Apple II. Direct connection to telephone jack. Performs auto dial/auto answer under program control. Has FIFO memory for telephone numbers. Uses 28 keyboard commands. Synchronous mode optional.
AMIIA		Acoustic coupler intelligent interface	Apple II	$179.50	Connects to Apple Game I/O socket. Does not require interface card. **CIRCLE 211**
MICROMODEM II	Hayes Microcomputer 5835 Peachtree Corners E. Norcross, GA 30092	Direct connect, programmable, plug-in automatic modem	Apple II	$379	Plugs into Apple II bus, other unit directly connects to telephone jack. **CIRCLE 212**

personal computer user are duplex modems. This means that data can be moving in both directions on the line to which the modem is connected. A half-duplex modem allows this bi-directional data flow in only one direction at a time. Thus a terminal transmitting to a computer will not be "listening" for a return transmission from the computer until it has finished the initial transmission. It then can accept returns from the other end of the line—as in the case where the computer will echo back the received characters. This particular mode of operation is often called "echoplex."

Full-duplex operation means data are flowing in both directions on the communications line at the same time. This is accomplished in two different ways. If data are transmitted faster than 300 baud, full-duplex operation requires four lines to be connected to the modems—two for transmission and two for reception. If, on the other hand, the transmission is at 300 baud, the actual transmission in either direction takes so little of the line's bandwidth that the

NAME	MANUFACTURER	TYPE	APPLICATION	PRICE	FEATURES
MICROMODEM-100		Same as above	S-100	$350	Plugs into S-100 bus and has originate/answer direct-connect modem with automatic dial, under keyboard or program control.
HAYES STACK SMARTMODEM		External mount programmable, auto answer modem	Any computer or Terminal	$279	Externally mounted originate/answer modem. Direct connection to telephone jack. Can answer the phone, dial a number, receive and transmit data and then hang up the phone automatically. Status indicated by front-panel LEDs. **CIRCLE 213**
MODEM I	Radio Shack 1800 One Tandy Ctr. Fort Worth, EX 76102	Originate/answer direct connect modem	TRS-80	$149	Does not require RS-232-C interface card. Uses RS-232-C cable. **CIRCLE 214**
OHIO DATA	Ohio Data Products Corp. 14600 Detroit Ave. Cleveland, OH 44107	Acoustic coupler Kit only	Any computer	$79	Very low-cost modem kit. **CIRCLE 215**
PENRILL 300/1200	U.S. Robotics 203 N. Wabash Chicago, IL 60601	Direct connect Bell 212A	Any computer	$799	Direct connection modem, 1200 baud and 300 baud. **CIRCLE 216**
PHONE LINK		Acoustic coupler	Any computer	$179	300 baud compact originate/answer modem.
POTOMAC MM-103	Potomac Micro Magic 5201 Leesburg Pike Falls Church, VA. 22041	Plug-in direct connect modem programmable	S-100 bus	$399	Direct-connect modem plugs into S-100 bus. Originate/answer. **CIRCLE 217**
STAR Modem	Livermore Data Systems 2050 Research Dr. Livermore, CA 94550	Acoustic coupler	Any computer or Terminal	$189	Compact, 0-300 baud modem. Acoustic coupler. Originate/answer. LED indicators and switches. **CIRCLE 218**
TNW-103	TNW Corporation 3351 Handcock St. San Diego, CA 92110	Direct connect auto answer/auto dial	HP-85 PET/CBM	$389	Auto answer/auto dial modem for PET/CBM and HP-85 computer. Requires TNW-2000, or TNW-232-D interface unit to provide serial RS-232-C output. PTERM software provides terminal and EBS capability. **CIRCLE 219**
UDS-103	Universal Data Systems 5000 Bradford Dr. Huntsville, AL 35805	Direct connect Talk/Data 300 baud	Any computer	$195	Switch selectable answer/originate. Fits under phone. Has talk/data switch.
UDS-202		Same as above except 1200 baud	Any computer	$295	Same as above, except operates to 1200 baud. **CIRCLE 220**
USR-310	U.S. Robotics Inc. (see above)	Originate only Acoustic coupler	Any computer	$159	Low cost originate only modem.
USR-330		Originate/answer Acoustic coupler	Any computer	$339	Originate/auto answer modem. Crystal controlled. **CIRCLE 221**
VERSAMODEM Model 1080	Bizcomp P.O. Box 7498 Menlo Park, CA 94025	Direct connect	Any computer	$119	300 baud modem; Bell 103 compatible. **CIRCLE 222**



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CIRCLE 57

pass band can be split in two. Then transmission occurs on one of the bands, while reception is going on on the other half of the band.

Users who are connecting "dumb" terminals to a computer, as is the case in some large distributed-computing centers, will require full-duplex modems, even though their operation is half-duplex. That's because the "dumb" terminal has no way to signal that it has finished transmitting, so the equipment at the other end of the line doesn't know when it's safe to transmit.

When a personal computer is connected to a telephone line for communications, the situation is different. The computer tells the equipment on the other end that transmission has been completed, and that the other equipment is then free to transmit. So a half-duplex modem will suffice in this kind of application.

Then comes the but

But you have to remember that the computer must be told to send that end-of-transmission code for deciphering at the other end. To accomplish that chore, many vendors are pleased to offer data-communications software for personal computers. This software will accomplish the necessary "handshaking" that gets the machines connected properly and talking to one another.

The last selection criterion to be mentioned is the type of connection from the modem to the telephone. There are basically two—acoustic coupling and hard-wired interface.

The acoustic coupler is a device that allows for the insertion of a telephone handset. The modem produces the audible tones that the phone lines will carry, and feeds them to a small loud-speaker in the acoustic coupler. The other end of the handset is placed so it can "hear" tones coming over the line from the other end.

Acoustic couplers are relatively low in cost and so, they are attractive in many applications where absolute accuracy of the data is not essential. These couplers add a source of error to a system that is very error-prone—the phone company's voice-grade lines. Imagine what the static frequently heard on a telephone line, or the annoying echo one sometimes gets, can do to digital data travelling on the line. Then add the problem of loudspeakers which have a less-than-perfect response to stimulus, and the situation is ripe for error. It doesn't happen all that often, but it occurs

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RS 260-1165	LINE PRINTER V	$1,669.00
RS 260-1166	LINE PRINTER VI	$1,015.00

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RS 260-3001	4K COLOR	$ 325.00
RS 260-3002	16K COLOR W/EXT BASIC	$ 499.00
RS 260-3003	32K COLOR W/EXT BASIC	$ 684.00

Pocket Computer

Model No.	Description	CDA Price
RS 260-3501	POCKET COMPUTER	$ 198.00
RS 260-3505	POCKET INTERFACE W/PRINTER	$ 134.00

Atari Computers

Model No.	Description	CDA Price
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AT 400	ATARI 400 16K	$ 349.00
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CIRCLE 59

often enough that high-volume data users can't afford acoustic couplers.

These high volume users, then, go to direct-connect modems. The phone company has recently made this option a lot simpler with its introduction of modular phone systems. One simply unplugs the phone jack from the phone and connects the modem into the circuit. This works very well when one is using telephones that have a single number on them. If, however, it's a multistation phone, the modular connectors don't work, and the potential data communicator must buy another piece of equipment to couple the signals from the modem to the phone lines. These are available, but they are another expense that must be reckoned with.

Getting signals out

Data are fed from the computer to the modem through an RS-232-C port. This collection of letters and numbers refers to a standard for data interfacing that has been adopted by the Electronic Industries Association. The interface standard specifies the voltage levels that will be used in data communications, the functions of many of the conductors that will be used in making the physical connection into the interface, the number of conductors in the connector, and the shape of the connector to be used. The interface standard does not specify any coding for the data.

Making the connection

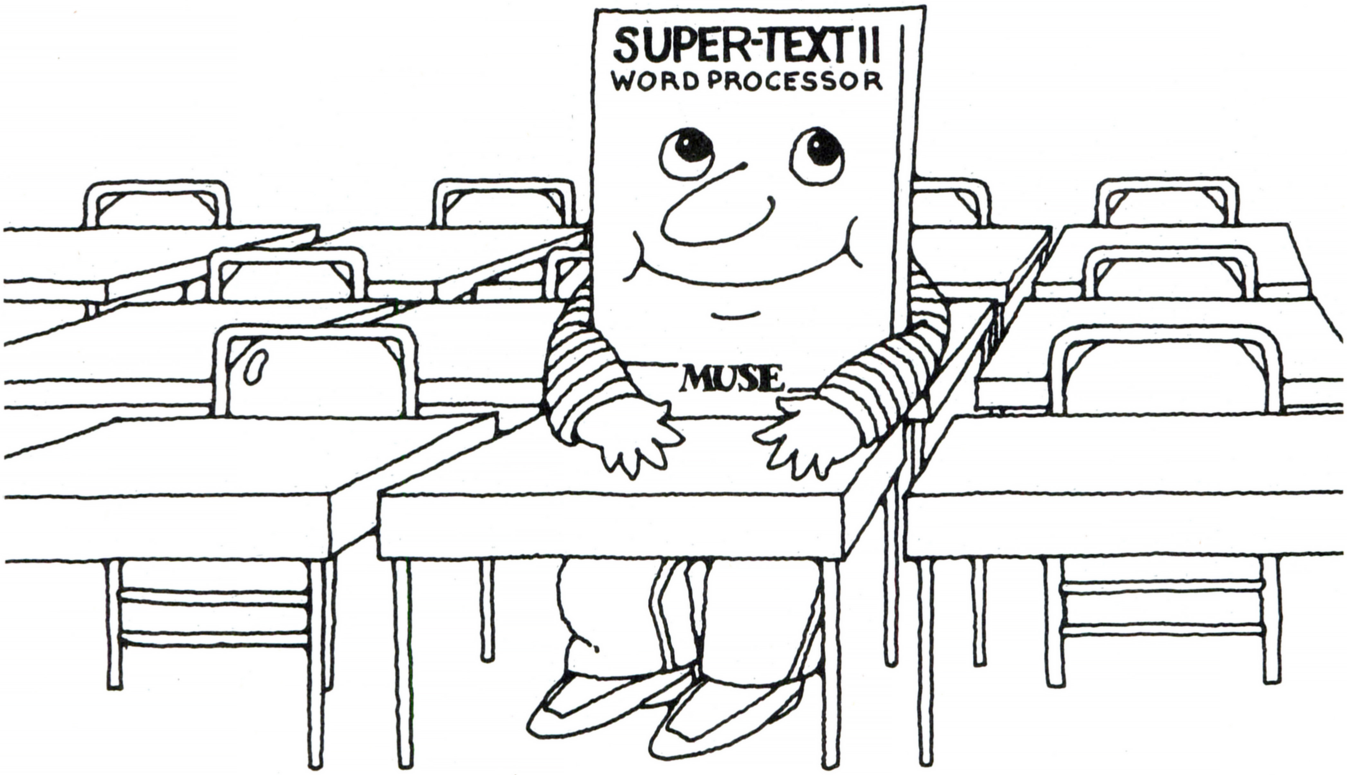
Earlier it was stated that the user merely dials the number of the machine with which he wishes to communicate. That's all the user does, but there's a lot more going on than just the ring on the phone line. It's all transparent to the user, but an elaborate "handshaking" scheme is being followed, ensuring a good connection to a piece of equipment that is ready to transmit. This handshaking is included in the data-communications software that is available for various personal computers.

This article contains a list of some of the vendors of data-communications software. All of them will be happy to sell software that will put the user in touch with the rest of the world. But remember that much of the software is aimed at performing one specific application, like using one of the many bulletin boards listed. If you have another application in mind, like talking to a friend in a distant state, that kind of special-purpose software won't work for the latter application.

Instead, for those kinds of applications, you'll need software that will allow the personal computer to emulate a data-communications terminal.

continued on page 102

Super-Text... In A Class By Itself.



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CIRCLE 60

COMMUNICATIONS SOFTWARE

BSTMS (Byrom Software Terminal Monitor System)

Distributed by Lifeboat Associates, 1651 Third Ave., New York, NY 10028.
Price: $200 per computer.

This program provides a link between a CP/M computer system and most dial-up computer systems. It will communicate with Micronet, The Source, community bulletin boards operating under CP/M, and TRS/80 and Apple bulletin boards. It will also talk to another CP/M console.

It stores data from the remote computer in CP/M files, copies data to the CP/M list device (printer) and transmits files to the remote computer. CIRCLE 223

PAN-Computer Mail-Support Software

Distributed by Personal Computer Network (PCNET). People's Computer Co., 1263 El Camino Real, Box E, Menlo Park, CA 94025.
Price: $12 (Cassette)

PAN is a completely self-contained computer system. Any two PAN systems can exchange messages over ordinary voice-grade telephone lines. PAN allows entry, review and automatic transmission of messages at times selected by the owner.

When a message is sent to PAN, it automatically answers the phone, receives and stores the message and hangs up the phone to wait for the next incoming, or outgoing message. When PAN has a message to be sent, it dials the number, verifies that the carrier is present and that PAN is active. CIRCLE 224

ABBS (Apple Bulletin Board System).

Micro Software Systems, 7929 Jones Beach Dr., McLean, VA 22102.
Price: $52

The ABBS is a program in Applesoft BASIC that provides a computerized bulletin board using a 32k, or larger Apple II Plus, (or APPLE II with Applesoft ROM card), Disk II Subsystem, printer, D.C. Hayes micro-modem and an optional clock board. CIRCLE 225

Forum-80

Bill Abney Forum-80 Headquarters, 7600 E. 48 Terrace, Kansas City, MO 64129.

This is the most popular TRS-80 version of the bulletin-board system. It requires a TRS-80 Model I or III with at least 48k of memory, an automatic-answer modem, RS-232-C capability and at least three disk drives for version 3. CIRCLE 226

CMMX

Hawkeye Grafix, 23914 Modile, Canoga Park, CA 91307.

CP/M communications system. Transfers all file types and sizes from other computers or time-sharing systems. CIRCLE 227

DATA CAPTURE 4.0

Southeastern Software, 6414 Derbyshire Dr., New Orleans, LA 70126.

Data Capture receives or transmits data files from one APPLE II to another. It saves and reads any Apple DOS sequential file. EXEC files can be created and edited. The system receives and transmits VisiCalc data files and sends or receives text files created with any editor that uses text files. Requires Apple II (48k) with a disk drive. Uses either a micromodem, or a communications card and any modem. CIRCLE 228

ASCII Express

Southwestern Data Systems, P.O. Box 582, Santee, CA 92071.

Intelligent terminal software for Apple II. Fully supports upper/lowercase modifications and permits Apple II to talk to any other computer. It uploads/downloads files, and has a built-in editor. CIRCLE 229

The Communicator

Dynacorp, 1427 Monroe Ave., Rochester, NY 14618.

Communication program for Atari. Makes Atari computer into a smart terminal. Receives and transmits programs and/or data to and from other computers, time-sharing service, or bulletin boards. Requires Atari 830 modem. CIRCLE 230

Micro-Courier

Microcom Inc., 89 State St., Boston, MA 02109.

Electronic Mail System for Apple II. Transmits messages to mailing list of up to 50 receivers. When clock board is used, this system will dial to any, or all of the receivers at the set time. Message will be transmitted and once the message has been recorded, the system signs off and dials the next number on the list. When all messages have been sent, the system hangs up to be ready for incoming signals. CIRCLE 231

Micro-Telegraph

Microcom Inc.

Works like Micro Courier except that it connects into teletype system and sends previously recorded messages. Replaces TWX machines at a fraction of the cost. CIRCLE 232

Z-Term

Southwestern Data Systems, P.O. Box 582-S, Santee, CA 92701.

Z80, CP/M communications software. Receives CP/M files up to 41k, can send any size files. Has auto SAVE mode, and sends XOFF character when buffer is full. Operator can SAVE and continue to receive data. Emulates any kind of terminal. Supports 40-column, or 80-column screen without re-configuration. CIRCLE 233

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CP/M
Z-80
apple II

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BASIC included. A powerful tool, BASIC-80 is included in the SoftCard package. Running under CP/M, ANSI Standard BASIC-80 is the most powerful microcomputer BASIC available. It includes extensive disk I/O statements, error trapping, integer variables, 16-digit precision, extensive EDIT commands and string functions, high and low-res Apple graphics, PRINT USING, CHAIN and COMMON, plus many additional commands. And, it's a BASIC you can compile with Microsoft's BASIC Compiler.

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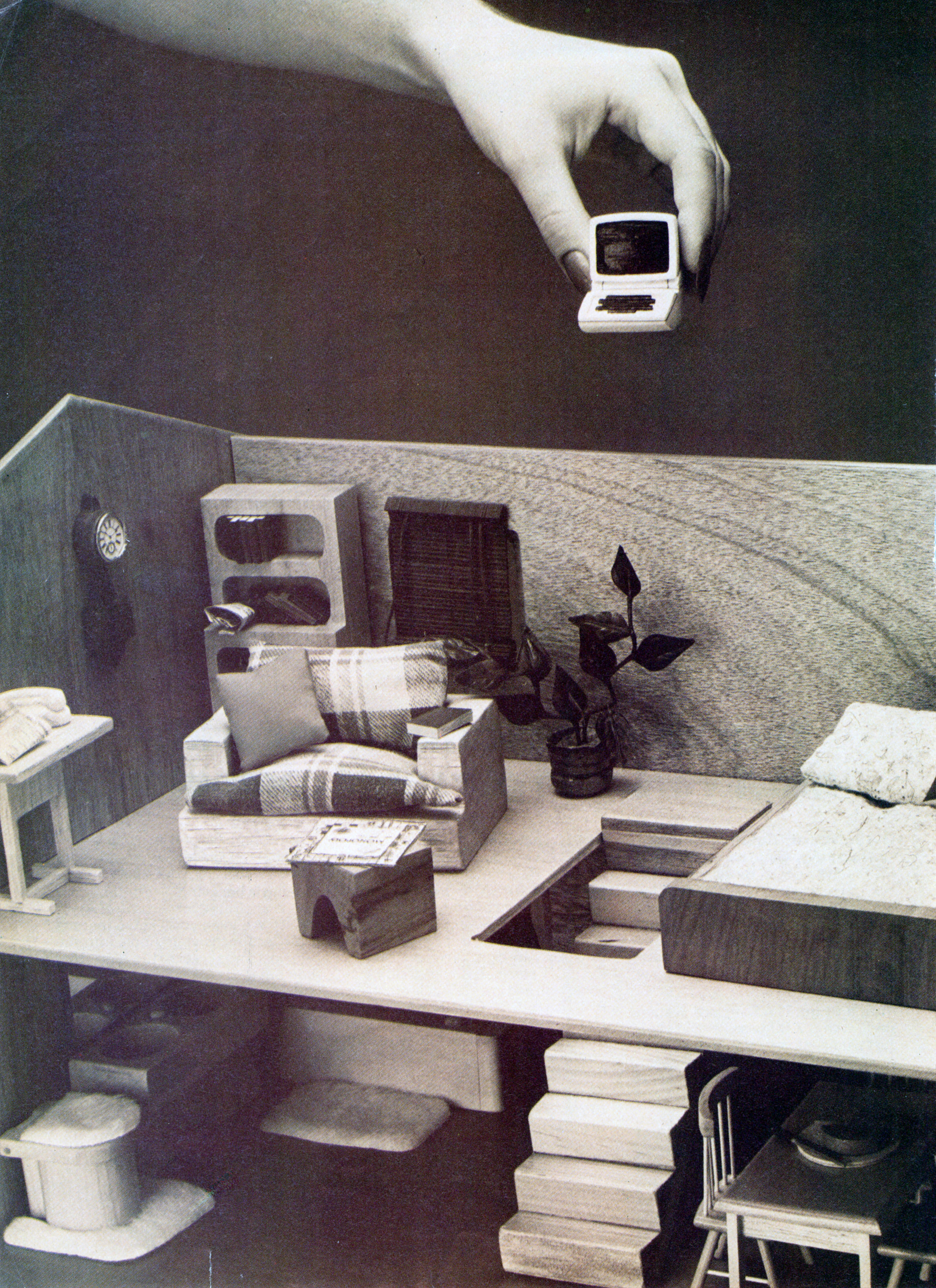

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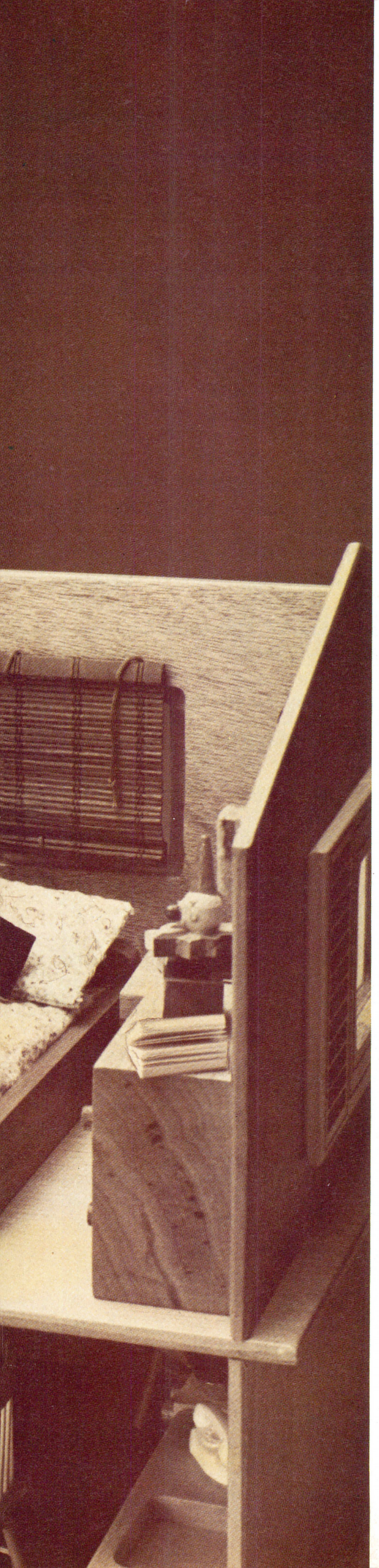


Ken McLamb

LEISURE COMPUTING

Computers in the Home Come of Age

Once they get computers into their homes, people find out what else they can do with them

Eleven-year-old Robert McNally used to skip to and from school past a computer shop in California's San Fernando Valley. He looked wistfully through the window once in a while, as any penniless kid would look into an ice cream parlor or pinball parlor. He was fascinated by science fiction, and he knew that computers made space games possible. One day in 1976 he worked up some schoolyard courage and went into the store to explore a glittering wonderland.

Today all five of the McNallys are finding their lives richer in various ways because of Robert's wide-eyed exploration. The Mr. of the family, Edward McNally, is a commercial photographer who was persuaded two years ago to buy a computer to simplify his invoicing. He has since found so many more professional uses that he plans to market the programs he's developed. The Mrs. of the family, Susan McNally, is a school psychologist who used the new home computer's word processing ability to send individualized form letters to parents of the schoolchildren she advised.

Michael, who is 14, is designing his own adventure games—having gotten bored with the ones from the store. Little Steven, not even born in 1976, is already a games player who knows you have to push certain buttons for enjoyable colors and actions, and certain other buttons to make the system work.

Robert is 16 now. He quit high school after passing the state's equivalency exam. He works full time for an educational software company and takes college computer courses at night. His goal is to become a designer of video games.

The McNallys might prove to be the prototypical family of the 1980s and 1990s. With equipment that most American families can afford—in this case an Apple II computer with a few of the most costworthy extras—they have brought the computer age into their home. The computer, an always-willing servant and playmate, is permanently welcome as an unobtrusive guest of the McNally family.

When the first of the personal computers was introduced in 1974, it was widely expected that millions of families like the McNallys would soon embrace the opportunity for a little computer to help them in their daily lives. Large public and private organizations had already found the vastly more expensive forms of automation to be indispensable.

Big computers kept entire factories running smoothly and brought the great swirl of corporate and institutional paperwork under push-button control. So oracles confidently predicted that computers of family-aimed scale and cost would win a quick revolution by making financial and other record-keeping less onerous, by taking the drudgery out of many little chores around the house, and by opening new vistas in self-education and personal creativity.

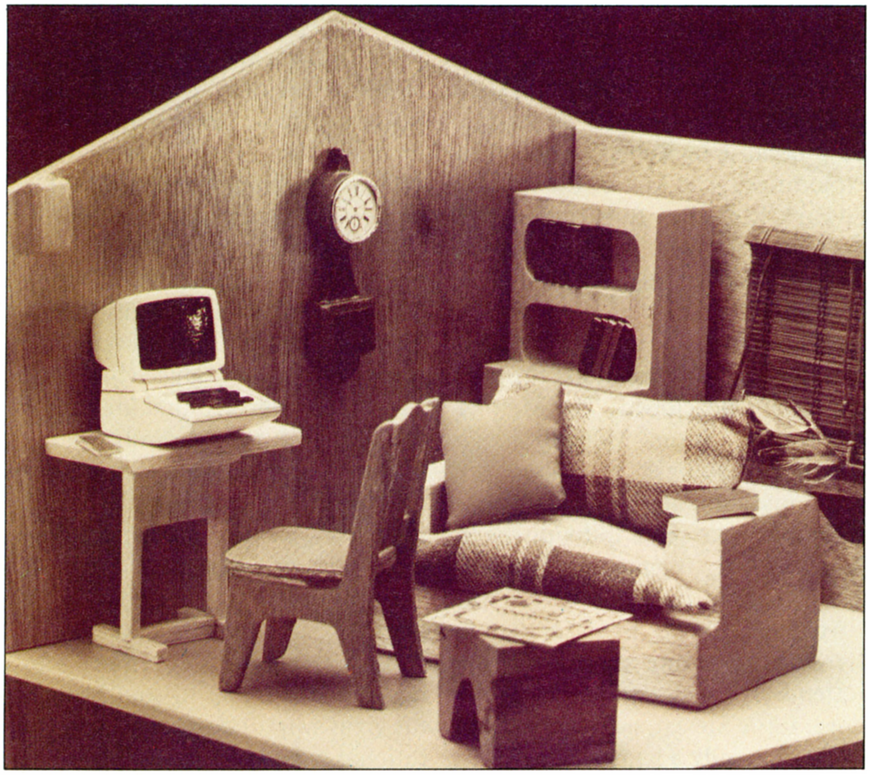
The prediction isn't true, yet. Personal computers have indeed captured the popular imagination as an affordable, fool-proof way to get more fun out of the TV set. Simultaneously, they are performing wonders for a rapidly growing number of businesses that don't need and couldn't pay for large computer capacity. But mass application for practical home use is several years behind and only recently has shown real signs of awakening. Why?

Conjecture is easy, as hindsight explanations probably hold some degree of validity. The easiest available systems did little to allay the average person's unease in confronting a smart machine which wanted things done its way. Software to make specific uses possible was sparsely supplied by the equipment manufacturers, and the slowly developing field of independent software-makers got an overall reputation for erratic quality of programs.

Some buyers found they had overestimated their aptitude and interest in feeding figures and facts into a system and interpreting the output, and they said so to their friends. The cost, though super-cheap by computer standards, was still a big item for the budget of a middle or even upper-middle-income family that wanted to do more than plug game cassettes into the TV. And economic times since 1974 have been less than desirable for this type of purchase.

The oracles are repenting their haste but they're likely to be right in the end. Personal computers now, compared with those you could get in the mid 1970's "are user friendly," which in computer lingo means they will cooperate more than one-half way in meeting the user's desire to get usable information without learning speech codes. Each major manufacturer now provides a moderate or wide scope for choosing home dedicated software at reasonable cost. And the independent software market is exploding with programs.

The cost for essential hardware, a la carte peripherals and software has gone in the opposite direction from inflation. It's safe to say that $500 or $5000 will get you far more practical value than the same amount would have bought a few years ago.



Quality of life up

While the millions still await the future, quite a few thousand people have discovered over the last couple of years that the maturing personal computer industry has what they need at home now. *Personal Computing* has surveyed home users, as individuals and as members of computer clubs sprouting all over the country, to find out how their friendly machines are improving their quality of life.

At any level of investment, the practical-minded computer users of 1981 report that bookkeeping and financial planning top the list of good home applications. If you're annoyed by thumbing through check stubs, or you couldn't remember which of three files a relevant tax piece of paper might be in, or you find it time-consuming to calculate the returns from various current or prospective stock-and-bond holdings every few days, the time is right to start thinking about getting an entry level, openly-expandable personal computer system. You will discover enough applications as time goes on to more than justify the

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VisiCalc is a fine aid for the computation of numerical problems. But it does have two major limitations: it is available only for a small number of systems, and its use is limited strictly to numbers, not words. To overcome these substantial limitations, Lifeboat Associates introduces T/Maker II.

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Easy to learn and use. You don't have to be a programmer to operate T/Maker II. Just follow T/Maker II's easily understood and ordered instructions, set up your data in rows and columns, define the relationships and T/Maker II will do the rest: it will perform the computations and formatting necessary to prepare your document. When you're finished you can analyze your report on your screen or store it on a diskette. Or, you can have the report printed with presentation quality.

And when any changes have to be made, simply enter the new figure or relationship and tell T/Maker II to adjust and recalculate all the new results.

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As an example of what T/Maker II can do, see the chart below. The operator entered only the data shown in boldface. T/Maker II calculated and reported all the other values.

	— Actual —			Growth		Total	— Projected —		
	1978	1979	1980	Rate	Average	(000's)	1981	1982	1985
Item A	**42,323**	**51,891**	**65,123**	24.04	53,112	159.34	80,782	100,206	191,262
Item B	**45,671**	**46,128**	**49,088**	3.67	46,962	140.89	50,891	52,761	58,791
Total	87,994	98,019	114,211	13.93	100,075	300.22	131,673	152,966	250,053
% Item	48.10	52.94	57.02	8.88	52.69	158.1	61.35	65.51	76.49
% Item	51.90	47.06	42.98	-9.00	47.31	141.9	38.65	34.49	23.51
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Software with full support

CIRCLE 62

purchase price of the machine.

That's with ready-to-work programs, at least at the start. You can modify them to suit your exact profile as need be and eventually build your own programs starting with a blank screen. The most remarkable report from our talks with today's home users is that many of them hadn't previously used any instrument more sophisticated than a typewriter or a microwave oven. But they have found today's personal computer systems to be so easy to get into that they soon learn to devise applications which are not part of a store-bought package.

Other ready-made applications for home users are not as universally desired as the simplification of financial work. Depending on a particular family's circumstances, for example, children might have their class learning reinforced by enjoyable spelling and arithmetic exercises. Adults might do the same with foreign-language grammar or higher math. Word processing, normally thought of as the province of businesses with a lot of standardized letters to send out, is surprisingly popular for personal writing as well as other household uses like compiling a menu file. The once-promising area of home control—automated timing of light switches and appliances, for instance—seems to still have little interest except among hobbyists who install and manipulate hardware—because it is a pleasurable way to spend a Saturday afternoon.

Define needs, set goals

What's genuinely nice about today's home computing is not merely the establishing and developing categories of application, but the possibility of defining your own needs, setting your own goals and reaching them without having to become a data-processing expert. A woman in Utah designs weaving patterns on her computer, then follows the print-out pattern to create the piece. A blind man in Michigan has filed away a data base on his coin collection, so if a fellow collector offers a coin of a given denomination, date and currency, he can determine quickly whether or not he already has that coin.

What's your own very specialized interest? Once you and your computer have gotten to know each other pretty well, it's likely you'll discover ways the computer can help you enjoy your interest more. And if it's a use that would interest other people too, you just might make a lot of money with it. Many nonprofessionals will spend time to

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by Clyde Cload, star reporter

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A subscriber, too engrossed in trying to save the world from invading aliens (March, 1981 issue) to give his name, stated, "I receive a 30 minute cassette by First Class Mail each month containing some of the best games and educational programs I have ever played. Some are even in machine language!" Another **CLOAD** subscriber, Claudine Cload, could now "fit the computer into her schedule" thanks to the utilities and occasional disk programs she received from **CLOAD.** She was writing about it to all of the people on her mailing list (November, 1979 issue).

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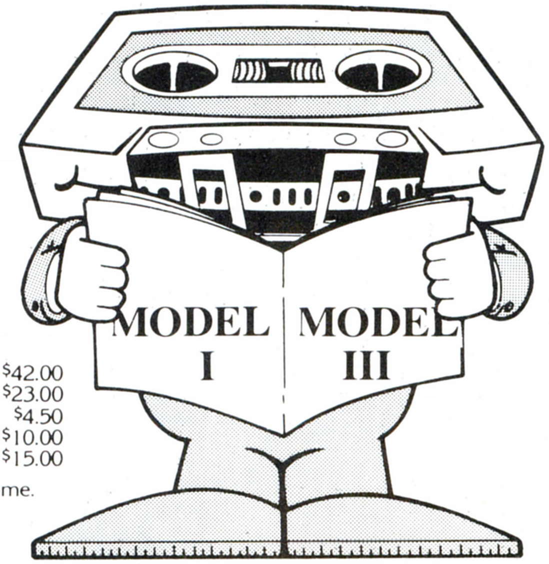

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CIRCLE 63

devise programs they hope to license, and some will succeed handsomely.

At this tender stage in the home-information revolution, many of the most convinced and enthusiastic users are people who get double duty from their computer systems—benefits related to their jobs as well as practical concerns of the family. Self-employed professionals and operators of small businesses are often integrating their personal and work information needs so finely on the home computer that little distinction remains between the two spheres. The portability of some of the most popular personal computers—having no more bulk and weight than an overstuffed briefcase—has resulted in the widening phenomenon of multiple-use "commuting": Mr. Smith might take the computer to the office to have easy access to his company's data base, then take it back home that night to work on the household budget, or to enable his wife to process some letters or his child to take part in an intergalactic shootout.

Brian O'Brien, a resident of Fabyan, CT, is a scientific consultant primarily in optics. He has found the combination of business and family accounting—especially budgeting and tax records—to be the single greatest value of his home computer. He was one of the early buyers of Texas Instruments' entry into personal computing, the TI 99/4, and he has expanded the basic model significantly with extra memory and peripherals.

The hardware includes a modem to permit telephone access to the Dow Jones information service, as he has also automated his personal stocks-and-bonds portfolio. He has taught himself sufficient programming to perform occasional theoretical tasks, such as projecting heat transfer within buildings of specified construction and structural materials. Mrs. O'Brien, a kindergarten teacher, has a collection of early-learning cassettes and takes the 99/4 to class, where four-year-olds are as delighted by interactive learning as they are with The Muppets.

Gene Jackson of Raleigh, NC, owner-manager of an independent fast-food restaurant, has put his business accounts, payroll administration and other business, as well as personal financial paperwork on an Apple II that stays at home. His system includes 48k of RAM, two disk drives and a printer.

Jackson taught himself to program. When he bought the system three-and-a-half years ago, he found

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little software available that met his purposes. He has since acquired and become one of the many admirers of the VisiCalc software package for financial modeling. He uses it regularly to analyze potential real estate investments—with scenarios for appreciation, interest cost and other criteria—and for other planning problems as they occur because "you can do almost anything with it." He's also doing his correspondence with the computer, finding it easier to use than the typewriter, and his home lighting is regulated by the computer's internal clock.

One of the most versatile range of applications is by a father and son, both professional engineers in Corvallis, OR. They actually have two of Hewlett-Packard's HP-85 computers but one doesn't count for our purposes here because it is used solely for monitoring in an energy-engineering consultancy headed by Joe Zaworski. Joe and his father John Zaworski, a professor of thermodynamics at Oregon State University, handily carry the other computer back and forth between their homes. Together they devised a self-tutorial German-language program, with a data bank of verb conjugations and noun declensions, which the senior Zaworski uses as an electronic flash-card system. The professor has also automated his classroom grading at home, and is drafting an academic paper on his experience in using the HP-85 to simulate thermodynamic processes. Joe is now setting up household-account programs that he says will be used easily by his mother, who has no acquaintance at all with computing.

Electronic inspiration

Bill and Linda Kaiser of Pittsburgh, PA, have similarly accumulated a balance of business and personal applications—some planned and some that didn't occur to them until the working system inspired imagination. Last September Bill bought an Apple II, for the benefit VisiCalc would have for his used-car dealership. Before long the family budget and checkbook records ran on the machine, too. Next came mathematical exercises for the children.

Linda, a nurse, bought a program that tells which of her house plants will thrive best in which parts of the house, with how much light and water. She is teaching herself typing with a computer program—naturally on the computer's own keyboard. Linda plans to get programs for recipes and menu planning, and eventually might get a start on a foreign language at the keyboard. Bill passes many a relaxed hour playing chess with his electronic opponent.

LaRay Geist, a geophysicist with Shell Oil in Houston, tells an ironic story of how the computerization trend—the big-business genie now having a cordial welcome in private homes—has, in his case, gone in the reverse direction.

Geist also selected the Apple II as the basis of a personal accounting system and for letter writing and other typewriter-substitute jobs at home, plus the possibility of plugging into the office's data processing setup. His wife Ginger, a graphic artist, also uses it for her business accounting and for word processing. Bill got the full 64k of RAM with two disk drives, and a Paper Tiger IDS 440 printer driven by an Apple-made parallel card. For word processing, he acquired Apple's optional Pascal-language operating system with editor, an unusual route that he recommends as "one of the better word-processor systems that is left off the list that you see."

Green-eyed monsters

The configuration attracted so much envy at the office that Shell installed a dozen virtually identical systems for Geist's fellow geophysicists and members of other departments to use on the job, linking their files to the main system by modem or direct wire. Some of the Shell users, needing compatibility with the CP/M operating system, achieved it with an optional Z80 card. Shell also provided Bidex 80-column display boards, which seemed to be such a good idea to Geist that he bought one for his home outfit. "There's been a lively interplay between the house and the office throughout the experience," Geist says.

Word processing, available as an inexpensive or expensive extra for any system depending mainly on how high the quality of printing must be, is widespread enough now that more than half of our random sample have that capability and use it often. Larry Kobylarz, who lives in Howell, MI and is a product design engineer for Bell Northern Research, has an Exidy Sorcerer I personal computer with 32k RAM—and his most prized "peripheral" is an IBM selectric typewriter with parallel interface to the computer. "It's really a rewarding use," he says. "The typewriting comes out error-free."

Kobylarz had used his typewriter-with-a-memory approach to store editorial material and a mailing list, and compose the layout for a club newsletter he wrote. He has no interest in the home-finance possibilities, but he got his Exidy in the first place to solve his wife's in-home working headache: In compiling and updating used-car prices as a commercial information service, Mrs. Kobylarz was constantly having to train new part-time clerical help because of high turnover. Kobylarz put the whole works on his computer, and the information and the job-performance have been reliable ever since.

Todd Hap, a high school senior in

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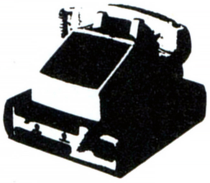

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CIRCLE 65

Ogden, UT, frequently uses his system's word-processing ability (a WordPro II package) to correspond with computer companies. With personalized letters on his own letterhead, he has built a file of catalogs and a data base on products available from about 50 suppliers of hardware and software compatible with his machine, an early Commodore PET 2001 that he has expanded to 32k RAM.

As a ninth-grader, Todd was doing his quadratic equations for algebra class on the computer. He has automated his school's attendance and honor rolls on another PET at the school, and has word processed letters for the school and its marching band. For fun, he has "drawn" scenic pictures for wall decoration and printed out a 12-month calendar to hang in his bedroom.

John Schueler, a retired teletype and satellite communications specialist, has two PETs—the 2001 and the more powerful 4052 model—at his home in Sedona, AZ. He's keen on amateur radio, and he and other ham operators all over the hemisphere use teletype accessories with their computers "to talk with our fingers instead of code." As an officer of a radio club, he has automated the mailing list, dues-paying records and other administrative data.

Foiling the burglars

Alone among the broad cross-section of home users we talked with, Joe Danzinger of San Francisco is involved with the benefits of computerized home control in an ambitious way. He has the credentials for the ambition: Now a salesman of electronic and mechanical goods, he was an audio-visual consultant in Hollywood. For client Sammy Davis, Jr. Danzinger built, from scratch, a home closed-circuit TV system so elaborate the control panel had 32 switches.

The home security system Danzinger has just built for himself is much less costly but still impressively conceived. With the Atari 800 he bought at the beginning of this year, Danzinger applied the graphics commands that come with the machine's video games ability to lay out the interior and exterior of the house with doors, windows and three front-yard gates in perspective. Using standard burglar alarms and reed switches, he connected each possible entry point with an input/output port in the computer. When a door, window or gate is opened—Danzinger especially likes the gates because a burglar wouldn't expect them to be wired also—the short-circuit rings bells in differing sequences and tones according to programmed subroutines, and the location is flashed on the screen layout.

"I plan to wire the house for everything," Danzinger said. "I'm thinking as I go." He's getting ready for cool-weather thriftiness by combining sensors and a controlled-clock program so the Atari will regulate his furnace according to actual temperature and the time of day. After that, he will distribute sensors again that would short out at around 140 degrees F., and cause the location of a fire to be shown by simulated flames leaping on the display screen.

The most ingenious and sophisticated home applications will require some degree of acquired skill and improvisation. But the underlying fact of personal computing today is that the average person can shake hands with a friendly machine and, in almost no time, begin getting information that helps to expand the horizons of home life.

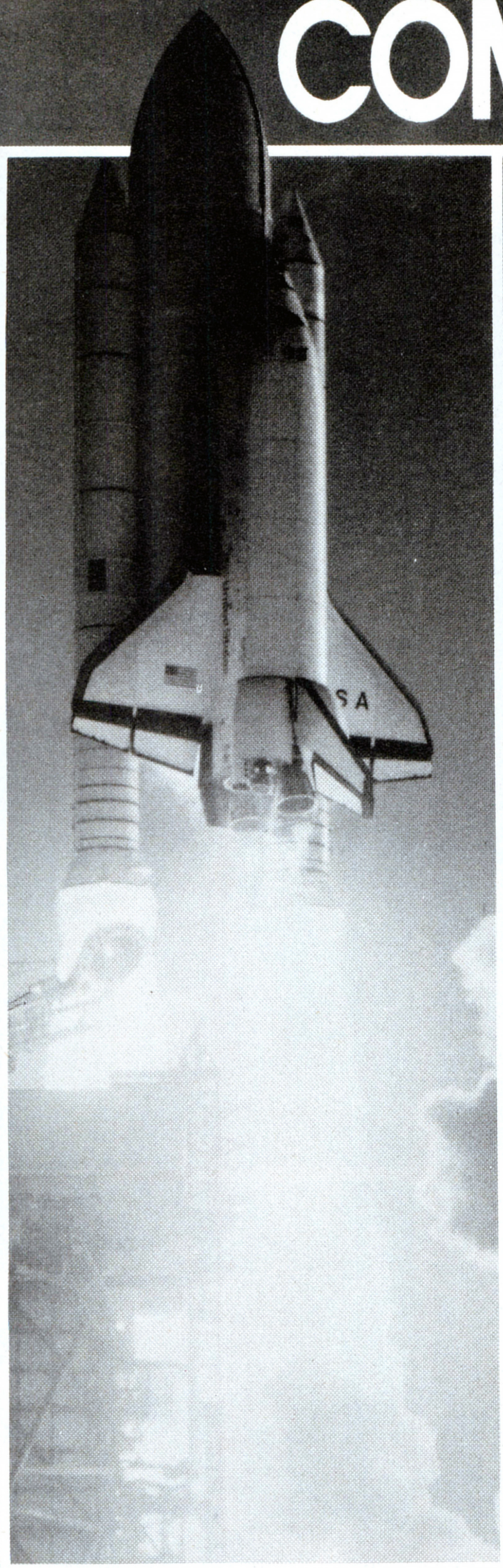
One example of a group of applications, which is equalled by other systems manufacturers and is supplemented by the independent software market is from Atari. They have included home-suited functions that are ready to go after you've learned the manual and the keyboard: A personal financial-management system, investment analysis for bonds, stocks, mortgages and loans, mailing-list maintenance, word processing; personal-development programs in physical fitness, music composition, typing, biorhythms, three foreign languages at the talking-computer level, BASIC programming language; educational cassettes covering effective writing, supervisory skills and electricity as well as the classic sectors of liberal arts and practical education.

The Oberding family of Sausalito, CA, provides a yardstick of where practical, cost-productive personal computing stands today. Fred Oberding, a retired U.S. AirForce officer, has a Radio Shack TRS-80 Model I which he has expanded to 48k RAM and otherwise upgraded to be nearly the equal to the newer Model III. He keeps his check book balanced and performs a group of similar financial chores. His wife uses word processing.

But he also subscribes to Micronet and CompuServe time-sharing services which enable him to store more data than his computer holds. They also enable him to communicate with electronic mail which can be read only by the recipient. With the same modem, Juliet Oberding, a college journalism major, "reads" the Associated Press news wire. This allowed her to stay 10 to 12 hours ahead of the printed newspapers during a scoop exercise based on the Iranian hostage crisis.

These links of home computer, telephone and outside bases of data and actions are the precursors of the era, likely to arrive before the end of this decade, when shopping, banking and many types of work and yet unforeseen daily tasks can be performed at the home computer.

COME ON BOARD...



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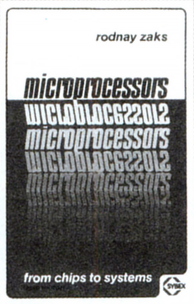

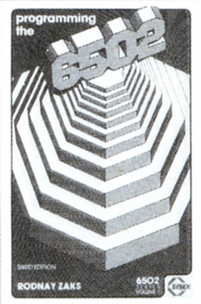

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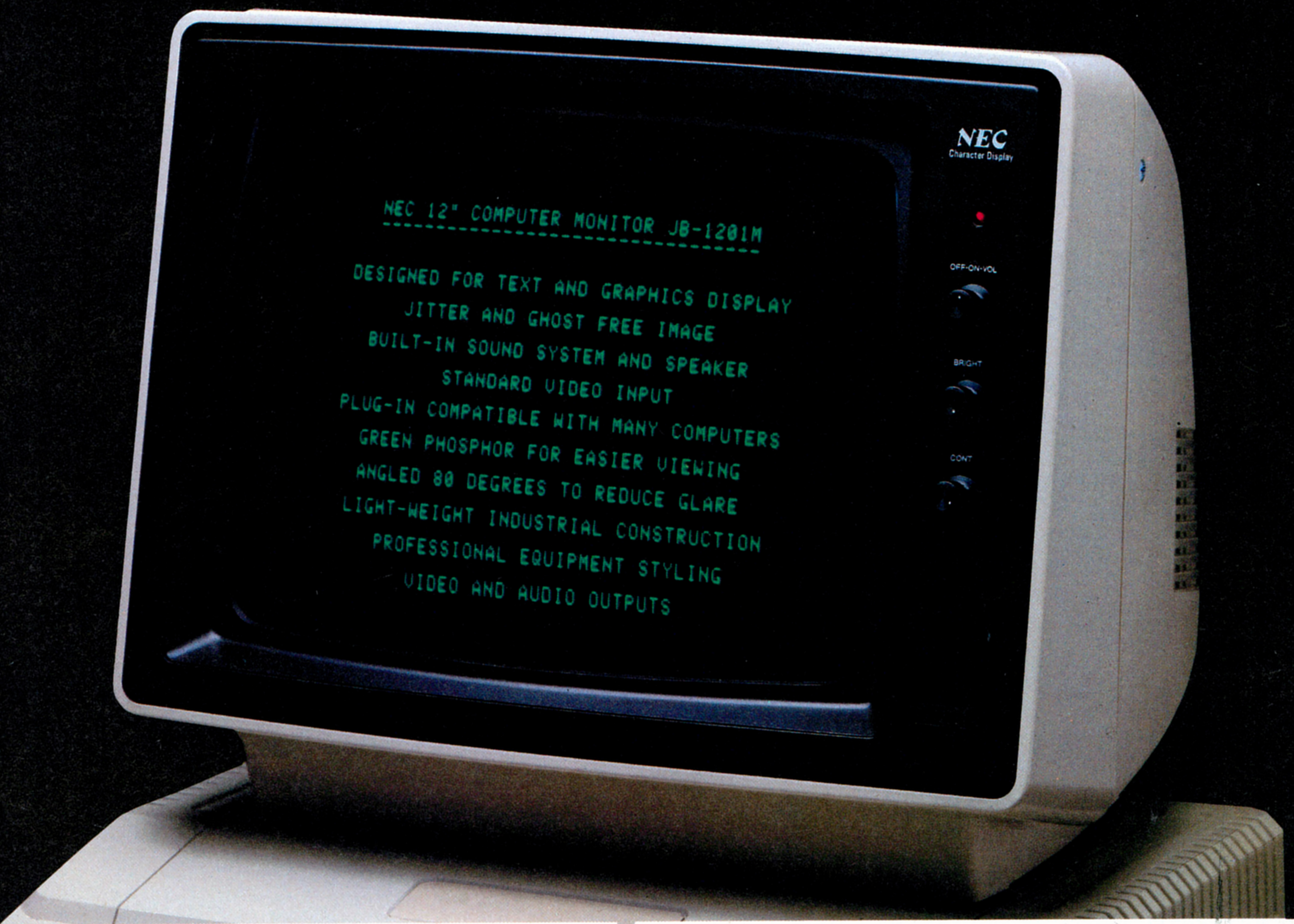

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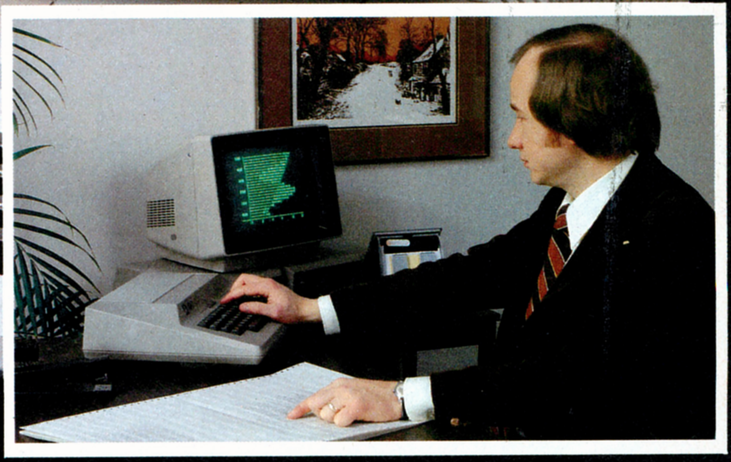

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CIRCLE 67

Jerald R. Malin

Low-Cost Expansion Interface for TRS-80s

This home-brew interface fired up at first power-on after construction.

It won't take a user of a TRS-80 Model I very long to run out of capabilities on the off-the-shelf machine. Soon he needs a printer, a disk drive, a modem, more memory and other items. These are, of course, available. But the cash often isn't. Users can get around this problem by buying inexpensive components and then providing the expensive labor normally furnished by the hardware manufacturer.

The LNW Research Expansion Interface Board is a case in point. The company, a mail-order house, will provide printed-circuit boards and instruction manuals for assembly. The buyer of the interface is then required to go out on his own and shop for the electronic components, which are soldered into the board.

The boards are of excellent quality. They are marked with silk-screen printing to show where the parts go. And there's a screened solder mask on both sides of the board to keep solder from going where it shouldn't.

The instruction book is well done. It guides the user through the construction of the unit, and it contains sections on the theory of operation and testing of the expansion interface.

One of the nicest things about the interface kit is a breakdown of necessary parts by feature. It allows the user to buy only those parts needed for the features he wishes to activate, saving other features for future expansion.

Comparison shopping pays

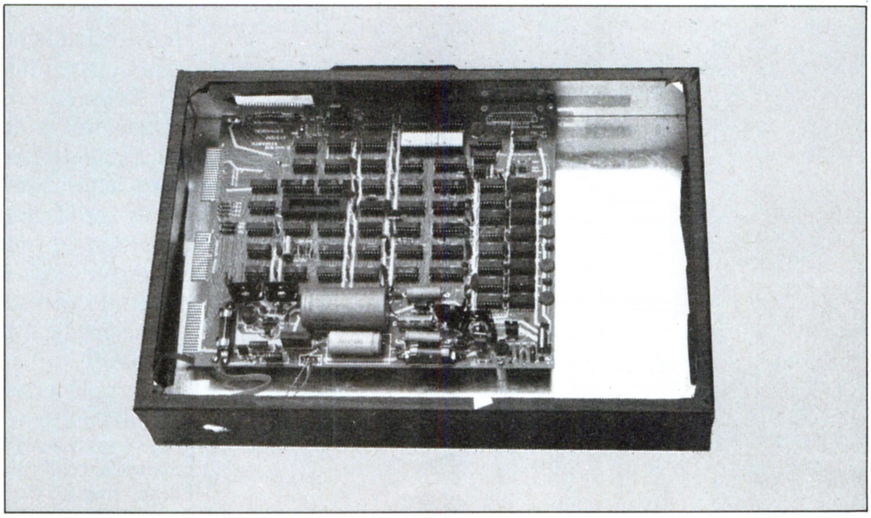
Users are cautioned to shop carefully for the parts for the board. Supplier prices vary. The cost of integrated-circuit modules for example, can differ threefold from one supplier to another.

With careful shopping, the total cost of the project should run about $250 to $300. LNW Research does offer an assembled version for $350, but that doesn't include memory. If you can solder reasonably well, you should be able to build the unit yourself.

Construction entails soldering in place about 60 integrated-circuit sockets, 60 resistors and 60 capacitors. Since the solder connections are spaced 0.1 inch apart, a standard size for integrated circuits, a low-wattage iron with a small tip is a must.

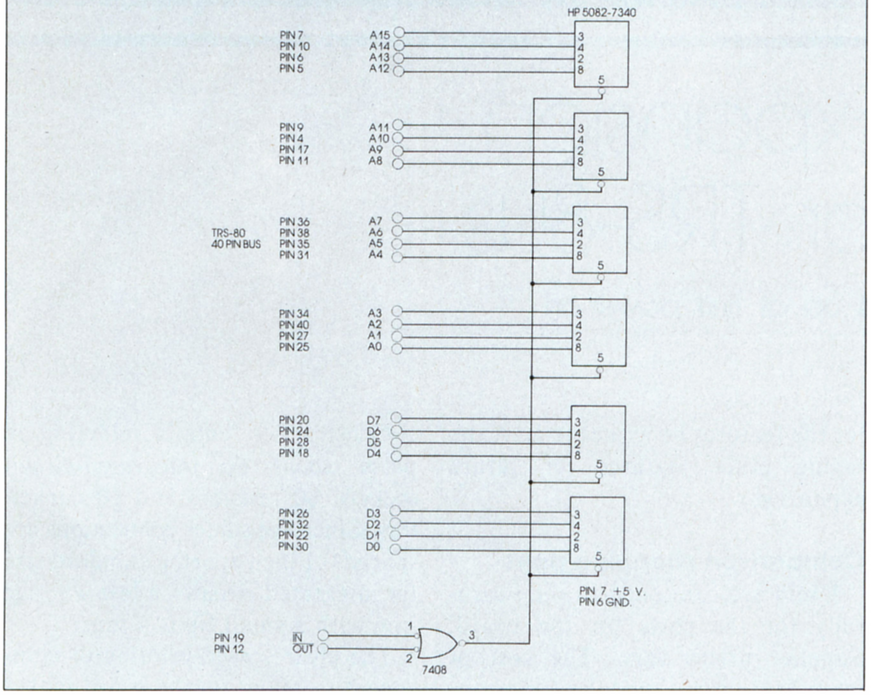
The clear screen-printing of component locations on the board makes it difficult to misplace a component, except in the case of two capacitors. Their positions are, however, clearly explained in the instruction manual.

The initial testing of the unit is also well described. The instructions tell the user how to check all the voltages with a volt-ohm meter. Next, the integrated circuits are installed, along with a few jumper wires, and then the



The LNW Research Interface Board mounted in an aluminum chassis.

Schematic diagram of the digital display used on this interface



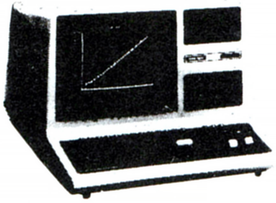
unit is ready for functional testing.

Getting cloudy

Here the testing instructions become somewhat less clear. The procedure essentially is to try the feature under test to see if it works. There is little information about what to do if the feature fails to perform.

In the unlikely event of a failure, you can usually trace it to either a bad integrated circuit, a solder splash or a poor connection. There are no wiring or logic errors on the printed-circuit board. So it makes sense to ensure that your components came from a reputable supplier—no hobby specials and "you-test-ems."

It's a good practice to use care when handling integrated circuits. Avoid static electricity by sitting still in one spot and grounding yourself to the circuit board and to the chip you're plugging in. Be especially



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CIRCLE 70

careful in handling the memory chips, the UART (universal asynchronous receiver/transmitter) and the floppy-disk controller, since these CMOS (complimentary metal-oxide semiconductor) chips are particularly prone to damage from static electricity.

Sockets are highly recommended for the integrated circuits. They make it easy to remove an IC should that need arise. Unsoldering one from a double-sided board with plated-through holes—which the board from LNW has—can be a nightmare.

Fire it up

Now the unit is ready for use. A word of caution for computer owners who are new to disk drives: Unless a drive is going to be used, don't plug in the floppy controller module when you build the unit. Otherwise the screen will fill with garbage when you power up.

What happens is that the system "looks" for the disk if the controller module is plugged in; the system wants to load the disk. If there is no disk, garbage remains on the screen. But if the controller isn't attached, the system won't look for the disk, and the normal MEMORY SIZE message will be displayed. At this point it's quite satisfying to enter "?MEM" and get back the reply "48340."

Users of serial printers will have to load a short routine that allows the printer to be connected to the RS-232-C port. The systems programming normally supports a parallel printer. The user-loaded routine tells the system to send the printer data to the serial port instead.

The instruction manual contains an appropriate program for the serial printer. There are other programs as well, like one that turns the computer into an intelligent terminal.

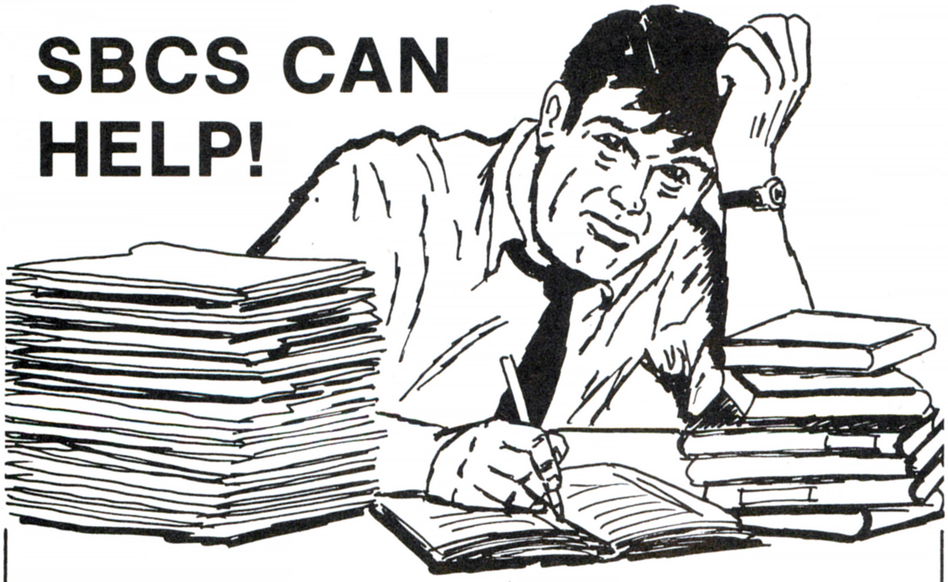
The only thing remaining is the packaging of the interface. One method that has worked well is the use of a chassis with bottom plate to house the populated board. The chassis can be covered with a wood-grain contact paper to match the stand it sits on. The photo shows the interface under the video monitor.

The digital readout in the center of the interface monitors the activity on the address bus and the data bus. It's useful in loading tapes or sending data to a port. It displays the activity on the bus during those long pauses when nothing else seems to be happening. The numbers are usually changing too fast to be read, but different operations cause very distinct patterns, so the user can tell whether it's a good or a bad load.

The display used on this interface is composed of Hewlett-Packard 5082-7340 hexidecimal indicators. They contain all the driving and decoding logic on the chip, so their connection is simple, as shown in the figure. The display is triggered by an IN or OUT command—essentially any command to the data ports. So any port activity is monitored.

One interesting feature of the interface is its dual cassette. You can, instead of installing the second cassette, install a small audio amplifier and speaker. Then a PRINT#-2 command will switch the audio line, eliminating any fuss in producing beeps.

The author, Jerald R. Malin, is a professional engineer. When not working at that, he can usually be found pursuing his other life as Radio Ham WB2LEI. He was assisted in the preparation of this article by Don Belle, W2BSG, Dave Fuseler, WN4GGH, and Ray Vasek, WA2QNX.



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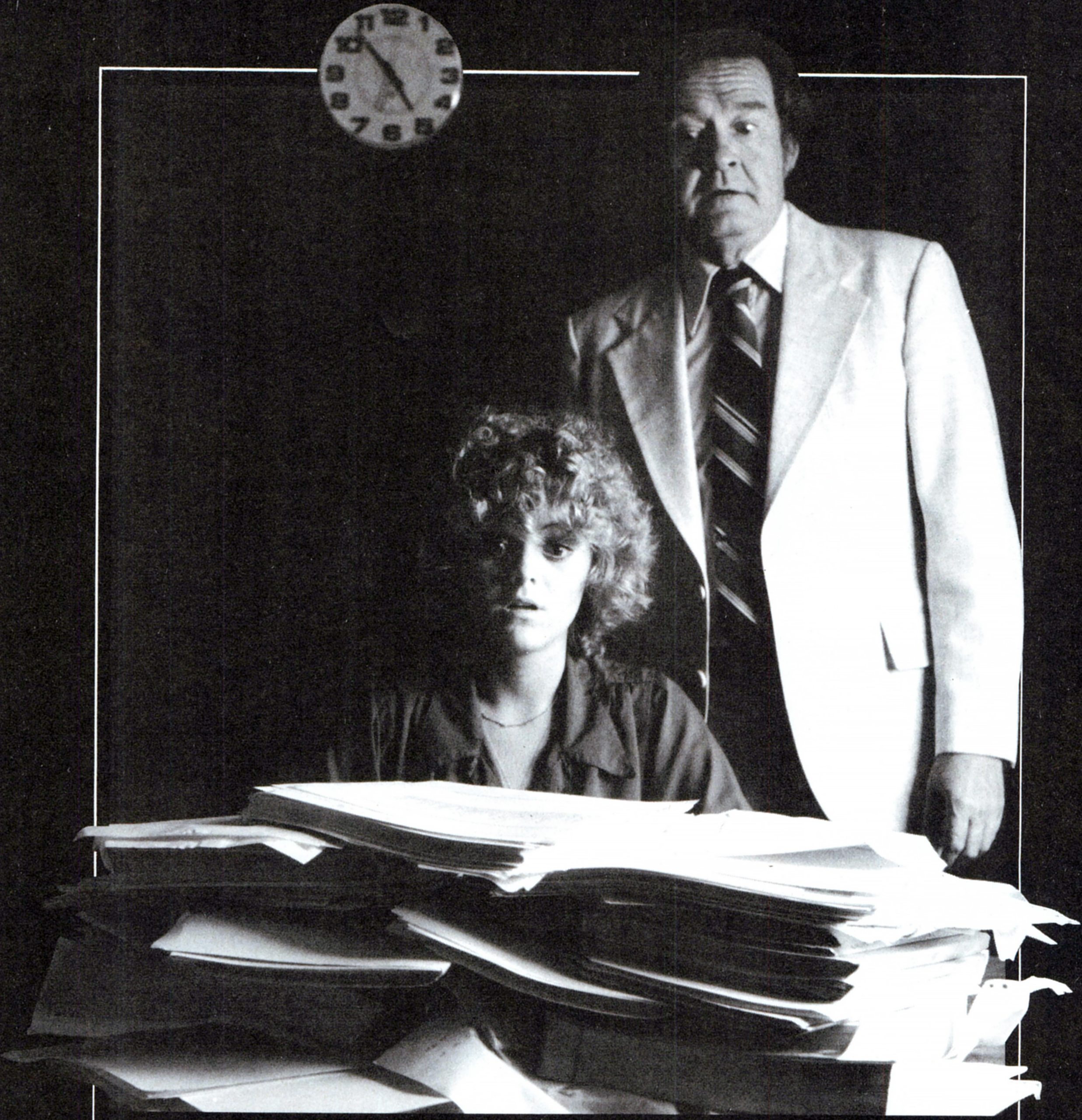

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INTERFACES

Graphics Interface

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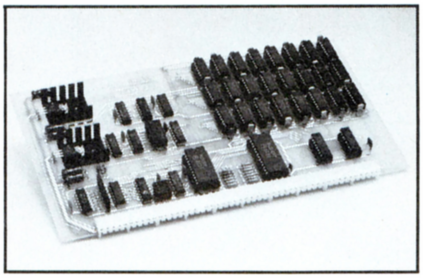
Texplot costs $450. For more information: Texprint, Inc., 8 Bianchara Rd., Burlington, MA 01803; (617) 273-3384. **CIRCLE 130**

RAM Card

A new RAM card for System-50 (SS-50 bus) 680X computers, designated the M48DSS, is available in 16, 32 and 48 kbyte versions.

Features include block organization into three independent 16 kbyte blocks, burn-in testing, memory test programs and 16 kbyte RAM kits for expansion.

The card costs $499.95 configured with 16 kbytes of RAM. Thirty-two and 48 kbyte versions sell for $599.95 and $699.95, respectively. RAM expansion kits sell for $99.95.

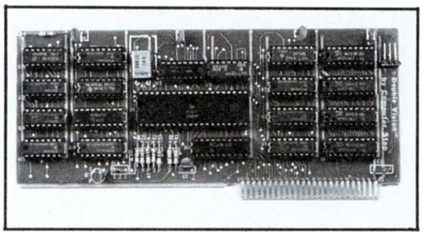


For more information: Percom Data Co., Inc., 211 N. Kirby, Garland, TX 75042; (800) 527-1592.
CIRCLE 131

Video Display

Several new features for DoubleVision, an 80 x 24 video display, include the availability of hardware schematics and a source listing of software.

DoubleVision is compatible with Z80 Softcard, Magic-Wand, Wordstar and Phoenix Word Processors, DB2 Data Management System under Digital Research's CP/M system, CCA data management system and full screen mapping.



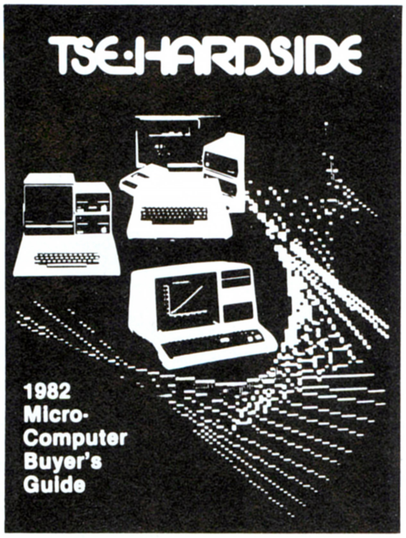
DoubleVision is priced at $295. For more information: Computer Stop, 2545 W. 237th St., Suite L, Torrance, CA 90505; (213) 539-7670. **CIRCLE 132**

COMMUNICATION

Atari Modem

Microconnection, a direct connect modem for interfacing the Atari 400/800 computer to the national telephone network, has been introduced by the Microperipheral Corporation. The modem is Bell 103-

The TSE-HARDSIDE 1982 MICRO-COMPUTER BUYER'S GUIDE



is now available! We've included such valuable information as print samples from each of the printers we carry, feature-by-feature comparisons of Micro-Computer systems in an easy-to-read table format, an informative article on Micros, and pages and pages of complete product descriptions.

We're making this valuable reference available for only $2.95 (refundable on your next purchase from TSE-HARDSIDE.) Charge customers are welcome to call our toll-free number: 1-800-258-1790 (in NH call 673-5144) THE TSE-HARDSIDE 1982 MICRO-COMPUTER BUYER'S GUIDE will soon arrive at your address via first class mail.

Send to:

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Dept. C, 14 South Street
Milford, NH 03055

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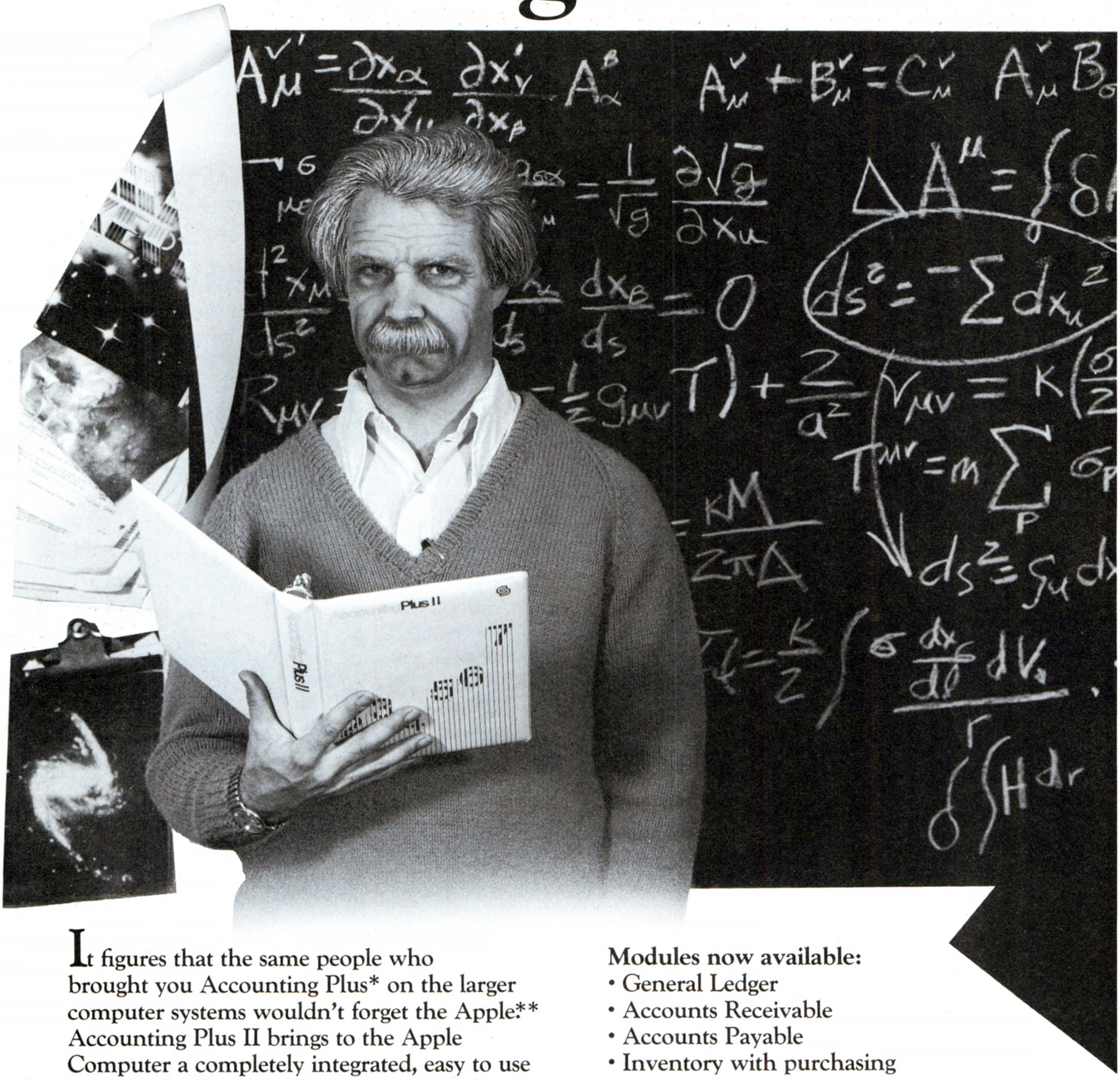
TSE-HARDSIDE 1982 Micro-Computer Buyer's Guide. PC9

☐ I've enclosed $2.95 ☐ Please send only your FREE Price List
☐ Charge to my credit card ☐ MasterCard ☐ Visa
Card No. ______
Interbank No. ______ Exp. Date ______
Signature ______
Name ______
Address ______
City ______
State ______ Zip Code ______

CIRCLE 73

Accounting Plus II
It Figures



It figures that the same people who brought you Accounting Plus* on the larger computer systems wouldn't forget the Apple.** Accounting Plus II brings to the Apple Computer a completely integrated, easy to use accounting system. Accounting Plus II doesn't require any special hardware, only 48K of RAM and two floppy drives or hard disk, and you don't have to be a CPA to use it. Accounting Plus II organizes and streamlines your paper flow and generates checks, invoices, statements and purchase orders on pre-printed forms. The system supports a solid audit trail which your business requires and your accountant demands.

Modules now available:
- General Ledger
- Accounts Receivable
- Accounts Payable
- Inventory with purchasing

For additional information call or write
Systems Plus Inc., 3975 East Bayshore,
Palo Alto, CA 94303 Phone 415/969/7047

Seeing is believing.

Systems Plus

*TM of Software Dimensions, San Jose, CA
**TM of Apple Computers, Cupertino, CA

CIRCLE 74

MARK GORDON COMPUTERS

DIVISION OF MARK GORDON ASSOCIATES, INC.
P.O. Box 77, Charlestown, MA 02129 (617) 491-7505

COMPUTERS

Atari 800 W 16K	799.00
4K Model III	599.00
Model II 64K System	3499.00
16K Model III	879.00

DISK DRIVES

40 Track 5¼ inch drive	314.00
80 Track 5¼	544.00
4 Disk Drive Cable	39.00
Lobo w/controller	Call for price
Lobo w/ocontroller	Call for price

PRINTERS

Epson MX80	Call for price
Epson MX 70	Call for price
Okidata Microline 80	479.00
Okidata Microline 82	699.00
Okidata Microline 83	989.00
NEC 5510 w-tractor	2679.00
Diablo 630	2495.00

MISC HARDWARE

Expansion int TRS-80(Ok)	269.00
Novation D-Cat Modem	166.00
16K Memory Kit	35.00(2/65.00)
Leedex Monitor	149.00
Leedex 100G	169.00
Leedex Color Monitor	399.00
Printer Cable for above	49.00
ISO-2 Isolator	54.00
AC LINE FILTER	24.00
280 Softcard	289.00
Ramcard	169.00
Videx 80 COL BOARD	289.00
Videx KBD Enhancer	109.00
DC Hayes Micro Modem II	319.00
CCS and SSM Interface Cards	Call for price

STORAGE MEDIA

Scotch-box 10-5¼	27.00
Memorex-box 10-5¼	22.00
Plastic Storage Box	5.00
Verbatim 5½	25.00

OPERATING SYSTEMS

NEWDOS by APPARAT INC.	49.00
NEWDOS + by APPARAT INC.	99.00
MMS FORTH DISKETTE PRIMER	79.95
NEWDOS 80	135.00
VTOS	99.00

BUSINESS SOFTWARE FOR TRS-80, APPLE AND ATARI

Free enhancements and upgrades to registered owners for the cost of media and mailing. 30 day free telephone support. User reference on request.
Fully Interactive Accounting Package. General Ledger, Accounts Payable, Accounts Receivable and Payroll Report Generating

Complete Package (requires 3 or or 4 drives)	475.00
Individual Modules (requires 2 or 3 drives)	125.00
Inventory II (requires 2 or 3 drives)	99.00
Mailing List Name & Address II (requires 2 drives)	129.00
Intelligent Terminal System ST-80 III	150.00
The Electric Pencil from Michael Shrayer	150.00
File Management System	49.00
Sort 80	59.00
LJK Letter Perfect (Atari, Apple)	139.00
DB Master (Apple)	169.00
Disk Business Software available for Model III	Call for price

FINE PRINT

TRS-80 is a Tandy Corporation trademark. Use of above operating systems may require the use of Radio Shack TRS-DOS. Radio Shack equipment subject to the will and whim of Radio Shack.

ORDERING INFORMATION

We accept Visa and Mastercharge. We will ship C.O.D., certified check, or money order only. There will be a 40 percent deposit required on all C.O.D. orders over $300.00. Massachusetts residents add 5 percent sales tax. Stock to three weeks for delivery.

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To order, call toll-free 1-800-343-5206

master charge VISA

The Company cannot be liable for pictorial or typographic inaccuracies.
The above prices do not include shipping.

CIRCLE 75

HARDWARE UPDATE

compatible and operates in the originate or answer mode.

Features include the incorporation of a serial printer interface via a DB25 connector and the provision for on-line data storage. A cassette recorder can be plugged into the Microconnection and will spool on-line communications for later playback.

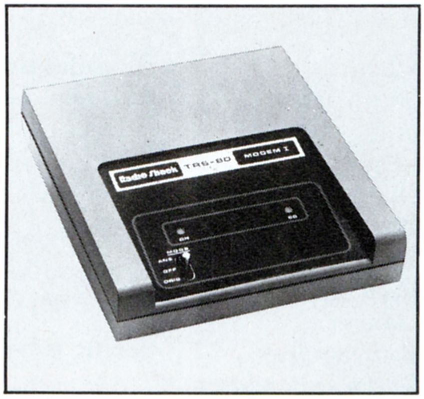
the microperipheral corporation
Microconnection

Included with the peripheral is a terminal communications program, power source and cable for interfacing to the Atari 800. The price is $249.

For more information: Microperipheral Corp., 2643 151st Place N.E., Redmond, WA 98052; (206) 881-7544. **CIRCLE 133**

TRS-80 Modem

The TRS-80 Modem I connects a TRS-80 directly to standard single-line telephones using the small plug-in "modular" jacks with which most telephones are equipped.



The direct connection technique eliminates data losses and errors which can result from the bumps and noises picked up by the telephone receiver.

The TRS-80 Modem I is FCC approved and Bell-103 answer/originate compatible. Modem I also provides half-duplex operation for 16k level II TRS-80 Model I systems without RS-232 through the computer's cassette port.

The TRS-80 Modem I costs $149. For more information: Radio Shack, 1800 One Tandy Center, Fort Worth, TX 76102. **CIRCLE 134**

Modem Improved

ESI Lynx introduced a new version of its direct-connect telephone modem for both TRS-80 Model I and Model III microcomputers replacing a previous model designed for use with Model I only.

LYNX
TELEPHONE LINKAGE SYSTEM
EMTROL SYSTEMS INC.

Features include auto-dial and auto-answer functions, originate/answer, programmable word length, parity, number of stop bits and full/half duplex. Also provided are active clear, break and control keys, programmable I/O porting, and either keyboard-dialing or stored-number dialing.

The package costs $299.95. For more information: ESI Lynx, 123 Locust St., Lancaster, PA 17602; (717) 291-1116. **CIRCLE 135**

PERIPHERALS

Storage Subsystem

The V1000 dual 8-inch drive subsystem accommodates mass storage units ranging from single-sided,

48K Apple II*or Apple II plus*

Time Manager™

Personal Information & Organization System

by Dick Ainsworth, Al Baker and Jeffrey P. Garbers

The most important program you will ever use with your Apple II* computer.

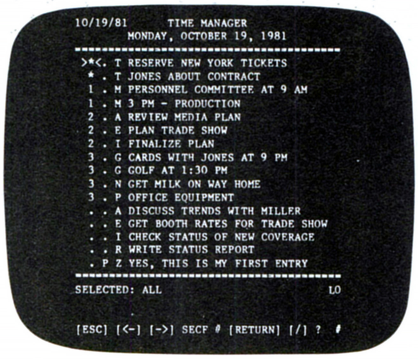
*Apple II and Apple II plus are trademarks of Apple Computer, Inc.

TIME SAVER

When you use Time Manager as your personal calendar, you create an automatic reminder and a permanent history file. By recording events as they happen, you can later retrieve a breakdown of time and expenses with a few keystrokes. You can easily organize and update all data, then create totals in several different categories for tax verification, expense reports and project evaluations.

DAILY ORGANIZER

Time Manager automatically provides a complete list of each day's activities, organized by priority. As you complete each item on your list, you can delete it or add it to your permanent records. Items scheduled but not completed become automatic reminders that head your list on the following day.



```
10/19/81      TIME MANAGER
        MONDAY, OCTOBER 19, 1981
----------------------------------------
 >*<. T RESERVE NEW YORK TICKETS
  * . T JONES ABOUT CONTRACT
  1 . M PERSONNEL COMMITTEE AT 9 AM
  1 . M 3 PM - PRODUCTION
  2 . A REVIEW MEDIA PLAN
  2 . E PLAN TRADE SHOW
  2 . I FINALIZE PLAN
  3 . G CARDS WITH JONES AT 9 PM
  3 . G GOLF AT 1:30 PM
  3 . N GET MILK ON WAY HOME
  3 . P OFFICE EQUIPMENT
  . . A DISCUSS TRENDS WITH MILLER
  . . E GET BOOTH RATES FOR TRADE SHOW
  . . I CHECK STATUS OF NEW COVERAGE
  . . R WRITE STATUS REPORT
  . P Z YES, THIS IS MY FIRST ENTRY
----------------------------------------
SELECTED: ALL                         LO

[ESC] [<-] [->] SECF # [RETURN] [/] ?  #
```

MONEY SAVER

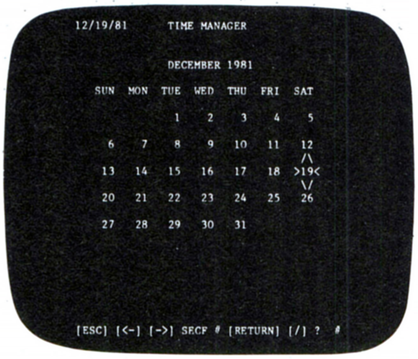
At tax time, the search and print features let you easily document expenses by category. If you itemize your business expenses and other deductions, this program could easily pay for itself in tax savings. Time Manager creates and totals expense records automatically by scanning your history for any category or keyword. With expenses linked to specific events, identification and verification are much easier.

EXECUTIVE DIARY

Time Manager's searching feature gives you immediate access to any past information. Documentation of important dates and events is automatic, as you enter them in your calendar or mark them as complete. By selecting a keyword or category, you can search through time and locate the exact date you made a particular phone call or paid your income tax.

APPOINTMENTS ALARM

If your Apple II is equipped with a hardware clock, Time Manager displays the time and date. You can also set the buzzer for any time during the day to remind you of an important meeting or to help you conclude those that go on too long.



```
12/19/81      TIME MANAGER


              DECEMBER 1981

   SUN  MON  TUE  WED  THU  FRI  SAT

                1    2    3    4    5

    6    7    8    9   10   11   12
                                  /\
   13   14   15   16   17   18  >19<
                                  \/
   20   21   22   23   24   25   26

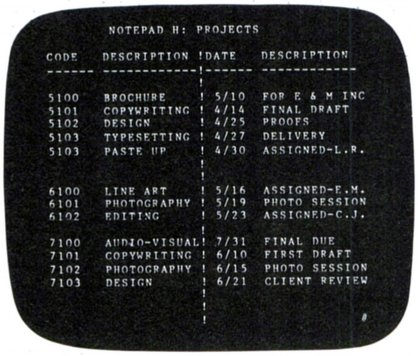
   27   28   29   30   31




[ESC] [<-] [->] SECF # [RETURN] [/] ?  #
```

PROJECTS COORDINATOR

Time Manager's category and keyword selection modes enable you to establish an infinite number of project titles or job numbers. After entering the information once, you can use cross reference searching to review all aspects of each project. This helps you keep track of schedules, employees, hours, dollars and deadlines. Time Manager gives you the power to see your data in any selection mode you choose, and get a printed update.



```
        NOTEPAD H: PROJECTS

CODE    DESCRIPTION !DATE   DESCRIPTION
------  ------------!------ ------------
                    !
5100    BROCHURE    ! 5/10  FOR E & M INC
5101    COPYWRITING ! 4/14  FINAL DRAFT
5102    DESIGN      ! 4/25  PROOFS
5103    TYPESETTING ! 4/27  DELIVERY
5103    PASTE UP    ! 4/30  ASSIGNED-L.R.
                    !
                    !
6100    LINE ART    ! 5/16  ASSIGNED-E.M.
6101    PHOTOGRAPHY ! 5/19  PHOTO SESSION
6102    EDITING     ! 5/23  ASSIGNED-C.J.
                    !
7100    AUDIO-VISUAL! 7/31  FINAL DUE
7101    COPYWRITING ! 6/10  FIRST DRAFT
7102    PHOTOGRAPHY ! 6/15  PHOTO SESSION
7103    DESIGN      ! 6/21  CLIENT REVIEW
                    !
                    !
                    !                  #
```

PORTABLE SECRETARY

In addition to the live data display, Time Manager and printer combine to give you hard copy records in seconds. If you are going to be away from your desk, for example, you might print a schedule of daily activities to take with you. You can also use Time Manager to create printouts of meeting agendas, project summaries and specialized lists.

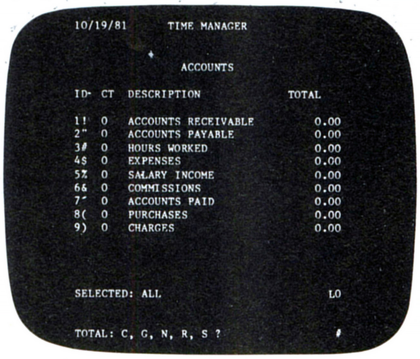
CIRCLE 76

PERMANENT HISTORY

As each year ends, you will use Time Manager to create a new data diskette and save the previous one as your history file. Information you had labelled "permanent" is automatically transferred to your new calendar. Your complete history file may be accessed for any totals, summaries, evaluations and reports.

FINANCIAL ASSISTANT

Time Manager keeps track of any numerical data you record in your daily entries, including expenses and the number of hours worked. If you wish, you can set up several accounts and use them in combination with 26 different categories to create financial summaries. Then, with a single keystroke, create itemized invoices, billing records and internal accounting reports.



```
10/19/81      TIME MANAGER

                 ACCOUNTS

ID- CT  DESCRIPTION              TOTAL

1!  0   ACCOUNTS RECEIVABLE       0.00
2"  0   ACCOUNTS PAYABLE          0.00
3#  0   HOURS WORKED              0.00
4$  0   EXPENSES                  0.00
5%  0   SALARY INCOME             0.00
6&  0   COMMISSIONS               0.00
7'  0   ACCOUNTS PAID             0.00
8(  0   PURCHASES                 0.00
9)  0   CHARGES                   0.00




SELECTED: ALL                       LO


TOTAL: C, G, N, R, S ?               #
```

DATA SEARCH

With appointments, meetings and social events already recorded in your calendar, it's easy to use Time Manager to locate any item. Information concerning people, projects, events and companies is readily available with a few simple commands. Specify a company, name or project title and Time Manager displays only those entries containing your selected word.

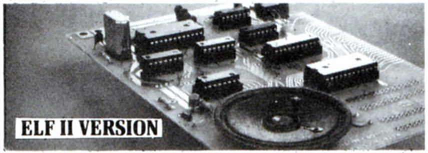
THIS DISK PROGRAM REQUIRES A SINGLE DISK DRIVE, 48K MEMORY

©Copyright 1980 The Image Producers, Inc.

IMAGE
COMPUTER PRODUCTS, INC

Available from your authorized Apple dealer.

NEW!!! THE
ELECTRIC MOUTH*



for S100, Elf II, Apple, TRS-80 Level II*

From $99.95 kit

Now — teach your computer to talk, dramatically increasing the interaction between you and your machine.

That's right: the ELECTRIC MOUTH actually lets your computer talk! Installed and on-line in just minutes, it's ready for spoken-language use in office, business, industrial and commercial applications, in games, special projects, R&D, education, security devices — there's no end to the ELECTRIC MOUTH's usefulness. Look at these features:

- ★ Supplied with 143 words/letters/ phonemes/ numbers, capable of producing hundreds of words and phrases.
- ★ Expandable on-board up to thousands of words and phrases (just add additional speech ROMs as they become available).
- ★ Four models, which plug directly into S100, Apple, Elf II and TRS-80 Level II computers.
- ★ Get it to talk by using either Basic or machine language (very easy to use, complete instructions with examples included).
- ★ Uses National Semiconductor's "Digitalker" system.
- ★ Includes on-board audio amplifier and speaker, with provisions for external speakers and amplifier.
- ★ Adds a new dimension and excitement to programming; lets you modify existing programs and games to add spoken announcements of results, warnings, etc.
- ★ Installs in just minutes.

Principle of Operation: The ELECTRIC MOUTH stores words in their digital equivalents in ROMs. When words, phrases, and phonemes are desired, they are simply called for by your program and then synthesized into speech. The ELECTRIC MOUTH system requires none of your valuable memory space except for a few addresses if used in memory mapped mode. In most cases, output ports (user selectable) are used.

Spoken Material Included

one
two
three
four
five
six
seven
eight
nine
ten
eleven
twelve
thirteen
fourteen
fifteen
sixteen
seventeen
eighteen
nineteen
twenty
thirty
forty
fifty
sixty
seventy
eighty
ninety
hundred
thousand
million
zero
again
ampere
and
at
cancel
case
cent
400hertz tone
80hertz tone
20ms silence
40ms silence
80ms silence
160ms silence
320ms silence
centi
check
comma
control
danger
degree
dollar
down
equal
error
feet
flow
fuel
gallon
go
gram
great
greater
have
high
higher
hour
in
inches
is
it
kilo
left
less
lesser
limit
low
lower
mark
meter
mile
milli
minus
minute
near
number
of
off
on
out
over
parenthesis
percent
please
plus
point
pound
pulses
rate
re
ready
right
ss
second
set
space
speed
star
start
stop
than
the
time
try
up
volt
weight
a
b
c
d
e
f
g
h
i
j
k
l
m
n
o
p
q
r
s
t
u
v
w
x
y
z

*"Elf II" and "The Electric Mouth" are reg. trademarks of Netronics R&D Ltd. "Apple" is a reg. trademark of Apple Computer Inc. "TRS-80 Level II" is a reg. trademark of Tandy Corp.

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Call (203) 354-9375

NETRONICS R&D LTD.

333 Litchfield Road, New Milford, CT 06776

Please send the items checked below:

☐ **S100 "Electric Mouth" kit $99.95**
☐ **Elf II "Electric Mouth" kit $99.95**
☐ **Apple "Electric Mouth" kit $119.95**
☐ **TRS-80 Level II "Electric Mouth" kit..... $119.95**

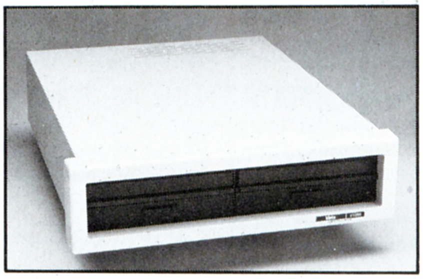
Add $20.00 for wired & tested units. All plus $3.00 postage & insurance. Conn res. add sales tax.

Total Enclosed $ ________

☐ **Personal Check** ☐ **Cashier's Check/Money Order**
☐ **Visa** ☐ **Master Charge (Bank No.** ________
Acct. No. ________
Signature ________ **Exp. Date** ________
Print Name ________
Address ________
City ________
State ________ **Zip** ________

CIRCLE 77

8-inch floppies to 20-Mbyte streaming tape cartridges and 40-Mbyte Winchester disk drives. On-line floppy disk storage capacity ranges from 250 kbytes to 2.5 Mbytes.



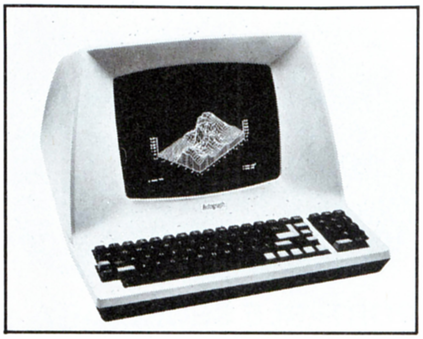
The V1000, with a choice of drive configurations, is priced from $1095 to $2295. The cabinet, with power supply only, is available for $495. For more information: Vista Computer Co., 1317 E. Edinger Ave., Santa Ana, CA 92705; (714) 953-0523.

CIRCLE 136

Display Terminal

Complete point-to-point control of graphic input is available on the Tektronix compatible Autograph Series 150 display terminal.

The terminal features Tektronix Plot 10 software compatibility; 250 x 512 resolution; selective graphic erase; white-on-black or black-on-white display; 24 lines of 80 ASCII alphanumeric characters; block and conversational mode options; protected fields; full editing capability and other communication options.

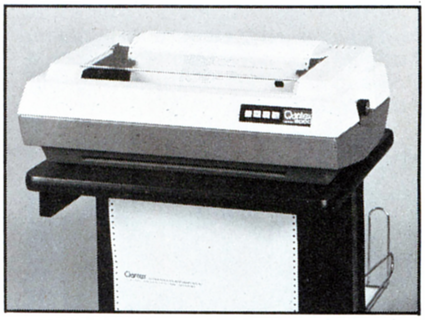


The terminal emulates the Tektronix 4010 and 4012 terminals. It can be used for business graphics and in scientific and educational applications installed on computer systems using Tektronix Plot 10 IGL software. Business graphics include pie charts, bar graphs and line graphs that convert large amounts of printed data into pictorial form.

The Autograph 150 is priced at $2590. For more information: Computer Products, 2615 Miller Ave., Mountain View, CA 94041; (415) 948-8961. **CIRCLE 137**

Impact Printer

A dot-matrix impact printer, the Qantex Series 6010, safeguards against loss of data and has a 2-kbyte message buffer that allows printing of a full 1920-character CRT screen without restraint pauses. The printer can accept 80 more characters after the generation of a restraint signal.



The printer is microprocessor-controlled and operates at 150 characters per second with a 9x9 dot matrix. It is available with a Centronics-compatible parallel interface or an RS-232 serial interface operating at up to 19,200 baud. A rear-panel switch permits choice of an active or passive 20-mA current loop.

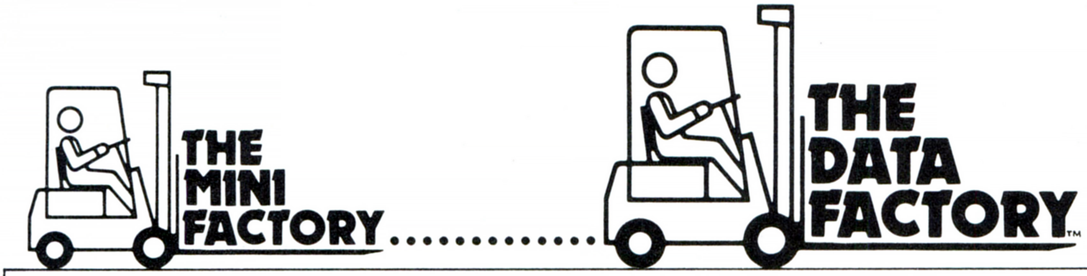
Features include adjustable page length from three to 22 inches in ½-inch increments, vertical tabs (four or six lines), fixed horizontal tabs at columns 1, 9, 17, 25, etc., and automatic skip fold, selectable at 0, four or six lines.

Suggested retail price is $1550 with parallel interface and $1580 with serial interface. For more information: Qantex Div., North Atlantic Industries Inc., 60 Plant Ave., Hauppauge, NY 11787; (516) 582-6060.

CIRCLE 138

(Advertisement)

The Best is even Better...



by William Passauer

You Can't Work Harder, So Work Smarter

This system is important to you. "The Data Factory" is the most versatile data base system yet developed for the micro computer. The Data/Mini Factory provides instant accessibility to your records and files which you can then, rearrange into new combinations to have vital information in seconds. The Data Factory was nationally rated as the best selling data base on the market, by a leading micro computer magazine. We have now expanded the original program with 40 new features on 3.3 DOS to make it even more powerful. The Mini Factory is almost identical to the original Data Factory program, and is a good introduction to the system at a very reasonable price.

Get The Best

The Data/Mini Factory will solve your problems. Major corporations, small businesses, schools, churches, organizations and home users have chosen it since we introduced it nationally last June.

Using this system, schools can set up library files (book lists and overdue fines), student records (grades and history), school reports (accounts payable or receivable, inventory lists, checkbook reconciliation) scheduling (teaching, class room, sports and recreational activities), as well as mailing labels, date reminders, and more.

Our Guarantee

This program will work. Micro Lab chooses to represent a very select group of professional programmers that meet our high standards for quality. Countless hours have been spent in our labs to insure these claims to you, and we back them with a contract with our dealers. Your Data Factory can always be updated when new versions of this program are released. The Mini Factory can be upgraded to The Data Factory when the users needs expand.

Most Advanced System

The latest breakthroughs in a data base system have been incorporated into this program. It was designed for constant use to input and manipulate data efficiently. The unique new feature that sets it apart from all others is its complete modifiability. Data may be rearranged, removing part of it from the original disk, to add to another or to form a new data base, without reentering the information again. Add, change, transfer, delete, replace, index, reconstruct, compute, and compare data at any time. Do an incredible 20 level search or sort and much more. The Data Factory is by far the best for performing the work that you must do from day to day.

Easily Learned

Any one can use it. The program prompts you as it runs. The easy to follow manual leads you through the set up of your data base. Data is stored on separate data disks, apart from the program. Only the data disks are copiable, allowing you to back up your data. The data file information is available for you to use with other programs.

Your Insurance

You can feel secure. Two identical programs are included with the original purchaser's package. If you make a mistake and accidentally blow a disk, there is no time or money lost. The Extended Warranty Policy is a revolutionary new plan for consumer protection. For a reasonable annual fee it covers all renewals needed on either The Data/Mini Factory and all updates adding new features to The Data Factory.

Requirements

The Data/Mini Factory is presently being offered for the Apple computer. You will need 48K and Applesoft in Rom. The system is as powerful with one disk drive as with two. It is slower but you do not lose any of its capabilities using only one disk drive. A printer or modem is an option with The Data/Mini Factory, but an 80 column board can be used only with The Data Factory. Micro Lab has developed another business system, "The Invoice Factory." It can work independently but is also compatible with the data on your Data/Mini Factory disks.

From A Dealer

"I have received 'The Data Factory' and I am pleased. It is everything that you represented and more. First, the packaging is impressive . . . Second, the manual is refreshingly well produced . . . Third, 'The Data Factory' does work! . . . I cannot ask more of a software package."

—Lyle Fernquist
Compudata Corp., Duluth, MN

Available Now

The Data Factory has a nationwide reputation as a reliable and easy to use data base. See a demonstration at your local Apple dealer. The price of The Data Factory is $150 and the Mini Factory is $75.

There are many reasons why you should buy the system—the ease of use, the features, the updates, Micro Lab's user support, and the fact that your investment in The Mini/Data Factory pays off in time savings every day. But you will find the best reasons when you ask someone who already has one. We are proud of our reputation and will keep working hard to maintain it.

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CIRCLE 78

INPUT/OUTPUT

I/O Package

The I/O package from Mosaic, H309, allows Atari users to connect their units to outside data lines.

With the package, Atari owners can build custom program controllers, interface with home control circuits, etc.

Price is $18. For more information: Mosaic Electronics, P.O. Box 748, Oregon City, OR 97045.

CIRCLE 139

Remote Terminal

A new electronic route sales accounting system for food distributors and an electronic sales "order book" are available from MSI Data Corporation.

Route Manager records order information for central computer processing and prints out invoices and sales reports. The MSI/84 handheld terminal serves as an electronic order book.

For more information: MSI Data Corporation, 340 Fischer Ave., Costa Mesa, CA 92626; (714) 549-6000.

CIRCLE 140

Interface Card

The Universal Interface Card from Quality Research is designed for any SS-50C system, such as the Southwest 6809.

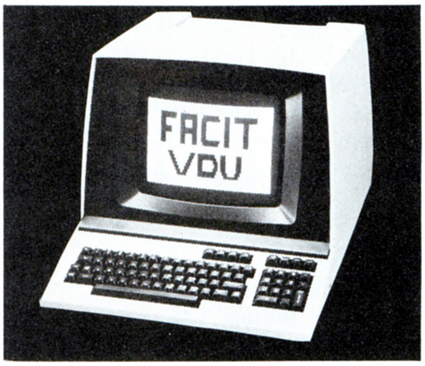
Space is provided for one PIA chip, buffering, and any logic the system may require. The card also contains a +5V regulated power supply.

Price is $14. Washington residents add 5 percent tax. Contact: Quality Research Company, P.O. Box 7207, Spokane, WA 99207. **CIRCLE 141**

Three Terminals

Three new smart video terminals from Facit emulate other leading terminals.

The 4410 emulates the Lear Siegler ADM 3A and Hazeltine 1410 terminals.



The 4420 emulates the DEC VT52, Hazeltine 1500 and Lear Siegler ADM 3A.

The 4430 has the same capabilities

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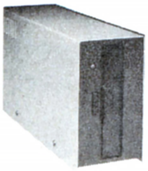

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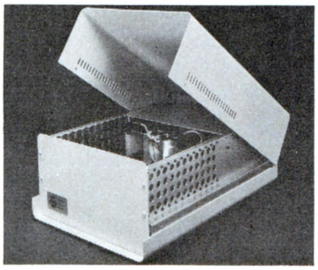
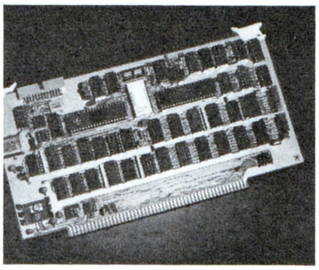
S-100 CALIFORNIA COMPUTER SYSTEMS





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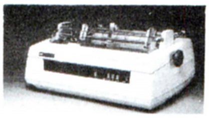

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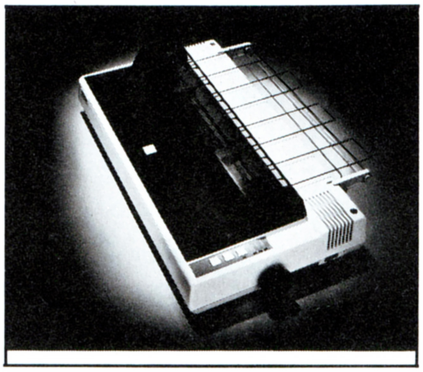
and features as the 4420 and is also DEC VT100-compatible.

For more information: Facit, Inc., 66 Field Point Rd., Greenwich, CT 06830. **CIRCLE 143**

Dot-Matrix Printer

The new MX-100 dot-matrix printer from Epson can generate quality printing in 12 different character weights and sizes.

Features include a disposable print head, a high-resolution graphics system, and the capability of printing up to 233 columns in the condensed print mode.



The MX-100 costs $995. For more information: Epson America, 23844 Hawthorne Blvd., Torrance, CA 90505; (213) 378-2220.
CIRCLE 144

SYSTEM

Development System

The PDS-80 Pascal Development System for CP/M applications is designed for the systems integrator or applications software developer.

Features include an operating system that uses the DMA and interrupt capabilities of Intersystems Series II disk controller and memory boards to buffer whole tracks in extended memory.

The front panel mainframe allows the user to examine or change any location in memory and permits the system to be used for both hardware and software development.

The PDS-80 system is furnished assembled and tested and includes a 2.54 Mbyte diskette drive unit, Intersystems Pascal, CP/M, and various utility programs.

Retail price is $7995. For more information: Ithaca Intersystems, 1650 Hanshaw Rd., Ithaca, NY 14850; (607) 272-2420. **CIRCLE 145**

Board Computer

Miller Technology has introduced an STD bus compatible microcomputer on a single 4.5- by 7-inch card. The heart of the MCPU-800 single board microcomputer is a 4 MHz Z80A microprocessor.

Four sockets are provided for 8 to 32k of EPROM or ROM, and zero to 64 kbytes of dynamic RAM may be used on the MCPU-800. Available sockets will accept triple supply 4116, or single supply 4516, 4132 and 4164 type RAMs. The standard bipolar PROM provides 32 memory map modes.

Software control of the IOEXP line is also provided, allowing I/O expansion to 480 ports. A programmable serial port gives software controllable bit rates from 30 to 56k. Eight I/O bits are associated with the serial port for modem or terminal control.

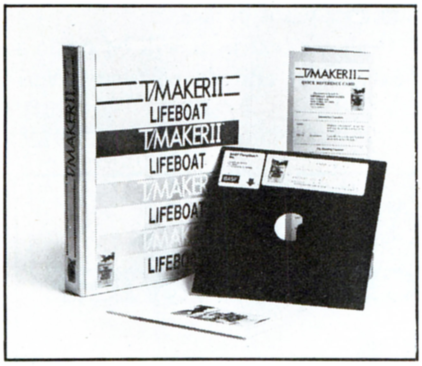
The price for an MCPU-800 with 64 kbytes of RAM is $1175; 16 kbyte RAM MCPU-800s start at $675. For more information: Miller Technology, 16930 Sheldon Rd., Los Gatos, CA 95030; (408) 395-2999.
CIRCLE 146

BUSINESS

Word Processing

Lifeboat Associates announces T/MAKER II, a combined numerical problem-solving and word-processing program for use on CP/M-equipped microcomputers.

T/MAKER II's advanced software produces charts and exhibits for reports, and, with screen text editing controls, it creates complete reports. Built into the program are such features as percentages and averages, making T/MAKER II ideal for financial use. Other automatic functions include logarithms and transcendentals for scientific applications.



For $275, the buyer gets the program, a user's manual and quick reference card. For more information: Lifeboat Associates, 1651 Third Ave., New York, NY 10028; (212) 860-0300. **CIRCLE 147**

Payroll Software

A payroll program that employs Apple computer Co.'s Run Time Module can accomodate 300 employees, 15 divisions and 30 deduction types. Developed by Broderbund Software, it computes all federal and state income taxes, plus other state and local taxes, for all 50 states. Tax formulas are built in and need not be entered by the user. The program also prints checks, W-2 forms, all quarterly and summary reports, and more.

The system requires two disk drives. Its suggested retail price is $395. For more information: Broderbund Software, Box 3266, Eugene, OR 97405; (503) 343-9024. **CIRCLE 148**

Budget Analyzer

A program to help plan and analyze a budget is available from Atari. It lets the user perform complex analyses and forecasting, as well as such common financial tasks as checkbook balancing.

Called the Atari PFMS, the program has features that make it flexible and easy to use. With keyword command, the user often has to type only a word to tell the computer what to do, rather than a series of words and numbers.

User-defined budget categories allow for up to 256 categories and subcategories of items. In addition, all records can be cross-indexed by a variety of titles.

Priced at $74.95, the system requires the use of an Atari 800 computer with 32k of RAM and an Atari 810 disk drive. For more information: Atari Inc., 1265 Borregas Ave., P.O. Box 427, Sunnyvale, CA 94086; (408) 745-5227. **CIRCLE 149**

Business Planning

Target, a business planning system for inexpensive computers, is said to replace time-sharing and large-scale computer planning languages, such as IFPS and FORESIGHT.

A major feature is the ability to display or print the entire set of data entries, calculation rules and report specifications, thus easing error detection and correction. Calculation commands are entered in English-like sentences instead of matrix algebra.

Target also makes planning easier for the user by providing conditional testing capability on data calculations—for example, min., max., greater than, less than, etc.

Developed by Advanced Management Strategies, the system is intended for use in computers using the CP/M operating system with at least 56k of memory and 200k disk storage. The Target Planner can be obtained from Westico, 25 Van Zant St., Norwalk, CT 06855; (203) 853-6880. **CIRCLE 150**

Accounting Package

A client write-up system for CP/M-based systems is being offered to certified public accountants. The general ledger system includes a video journal entry program with automatic paging, on-line account verification, automatic journal balancing and nine separate journal books. Reports can be directed to a VDT screen or printer.

For more information: Micronetics Inc., 1926 Hollywood Blvd., Suite 328, Hollywood, FL 33020; (305) 925-2333. **CIRCLE 151**

Payroll Software

A payroll system for small businesses, called Payroll I, is available for use on the TI 99/4 microcomputer. It allows businesses with fewer than 100 employees to operate a full weekly, biweekly, semimonthly or monthly payroll system.

The system, available from the Micro Software Div. of Charles Mann & Associates, automatically calculates and records all federal taxes and FICA, and also provides user-formulated fields for state taxes, insurance, union dues, etc. Salaried, commission and hourly employees can be handled.

Payroll I requires a single disk drive, a microprinter, Extended BASIC and a 16k CPU. The price is $199.95. For more information: Charles Mann & Associates, Micro Software Div., 7594 San Remo Trail, Yucca Valley, CA 92284; (714) 365-9718. **CIRCLE 152**

UTILITY

Voice Synthesizer

A new program for TRS-80 Model I, Level II computers, Sayit, allows use of the Radio Shack voice synthesizer to add voice output to BASIC programs. The program can be used to synthesize string expressions, numeric expressions or any combination of the two.

The program also provides a talking keyboard which echos each key struck and can be turned on or off from BASIC.

Minimum hardware requirements for Sayit are a TRS-80 Model I computer, Level II BASIC and a Radio Shack voice synthesizer.

Sayit costs $120. For more information: Baysik Speech, Suite 289, 1259 El Camino Real, Menlo Park, CA 94025. **CIRCLE 153**

Software System

A new software system designed for the SouthWest Technical 6809 and CT-82 terminal allows programmers to lay out full formatted screens and generate XBASIC programs to display them.

Included in the package are programs which add screens, update screens, and create new screens from modifications to existing screens. A program to display or print a directory of all active screens on file provides reference information. The system can also generate executable XBASIC code that will accept and display input for specified screens.

For more information: Davidson Software Systems, P.O. Box 21002, Lansing, MI 48909; (517) 332-5989. **CIRCLE 154**

Word Processor

The Wordcraft 80 word-processor software package allows a Commodore Business Machines (CBM) 8000 Series microcomputer to function as a word processor.

It shows text as it will be printed. Text can be edited and format veri-

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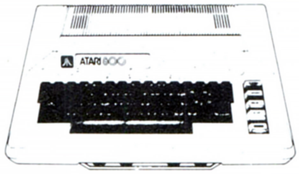

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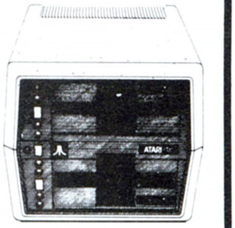

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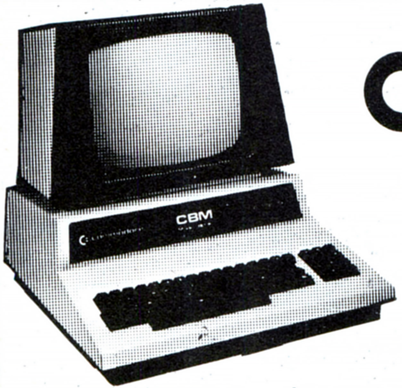

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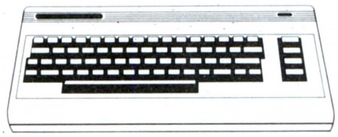

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CIRCLE 85

fied on the display without printing the document. About 350 pages of normal text can be stored on one standard mini floppy diskette using the Commodore model 8050 disk drive.

The processor runs with a minimum 32k memory. A Commodore model 4040 or 8050 dual disk drive is also required.

Wordcraft 80 costs $395. For more information: Commodore Business Machines, Computer System Div., 681 Moore Rd., King of Prussia, PA 19406; (215) 337-7100.

CIRCLE 155

Transferring BASIC

TSMART, a smart-terminal program for the Atari 800, permits transfer of BASIC programs between a remote host computer and an Atari storage device.

The program permits off-line text preparation with a text-editing or word-processing program for on-line transmission. Text can be created and stored, then transmitted.

The program can be used with any RS-232-C compatible modem. TSMART costs $79.95. For more information: MicroPeripheral Corp., 2643 151st Place N.E., Redmond, WA 98052; (206) 881-7544.

CIRCLE 156

Program Generator

The newly released Express option to the Oasis operating system combines the capabilities of an English-like inquiry language and an advanced program generator in a multiuser Relational Data Base Management System (RDBMS).

Express uses natural "free-form" sentences to compare, manipulate and report desired information from multiple files. Foreign languages can be implemented with user-defined dictionaries.

Express also includes a self-prompting and documenting screen creator and program generator.

The $695 Express package includes the Oasis File Sort option and compliments the $500 single-user and $850 multiuser Oasis systems.

For more information: Phase One Systems, 7700 Edgewater Dr., Suite 830, Oakland, CA 94621; (415) 562-8085, TWX 910-366-7139.

CIRCLE 157

GAMES

Magic Game

In the Dragon's Eye, the player has 21 game days (approximately half an

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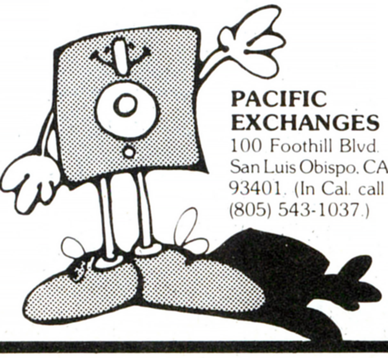

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Indicate end of page.
Set tabs from one to many.
Clear tabs from one to all.
Set temporary margins (wherever you like) as often as needed.
Repeat all typing keys as needed.
Underline copy.
Print bold face and underline.
Do reverse print (white on black), sort of "reverse Video".
Allow alphabetic and decimal tabulation.
Indent paragraphs.
Store in non-volatile resident memory:
  Often used line formats (margins & tab stops).
  Often used phrases (up to 835 characters) in 10 "bins".
  Up to 10 complete forms (tax, medical, insurance, etc.).
  Up to 14,000 characters in an additional 26 "bins*".
Print perfectly spaced proportional letters.
Return to typing position after correction with relocation key.
Allow one character to overlap another (Ø).
Right margin justification.
Print two columns with both right and left margins justified and the center ragged.
Lift off errors (from single character to entire line).

IT WILL EVEN:

Allow a carriage return without a linefeed or a linefeed without a carriage return.
Allow you to pre-set an impression control for high-quality carbon copies.
Allow both vertical and horizontal half-spacing.
Allow cancellation of copy before printing.
Allow express and normal backspacing.
Print in four different sizes: 10 pitch pica, 12 pitch elite, 15 pitch micron.
Allow insertion of a missing character in an already printed line.
Accept paper up to 17" wide.

Backspace 1/10, 1/12, 1/15 or even 1/60 of an inch.
Buffer and print out one word at a time, or one line or as many as 10 pages*.
Print up to 198 columns.
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hour playing time) to find a magical jewel held by an evil magician that gives its holder his power.

The player chooses one of 16 characters and gains a set of magical abilities which are different each time he plays. He is equipped with his choice of four swords, a bow and arrows and magical bolts.

The Dragon's Eye is available on cassette for the PET (32k) and on disk for the Apple (48k and Applesoft in ROM) for a suggested retail price of $24.95. For more information: Automated Simulations, P.O. Box 4247, Mountain View, CA 94040. **CIRCLE 158**

Two Apple Games

Sirius Software has announced the release of two Apple computer games—Gorgon and Sneakers. The Gorgon player must defend the planet by destroying creatures who have been reported stealing people from the surface of the Earth. The Sneakers player must stop waves of Cyclops, Saucers, Fangs, H-wings, Meteors, Scrambles, and Scrubs.

Both games require an Apple II or II Plus with disk drive and 48k. Gorgon uses either a 13 or 16 sector controller, and Sneakers is playable with keyboard or paddle. Gorgon is available for $39.95, and Sneakers for $29.95. For more information: Sirius Software, Inc., 2011 Arden Way, Sacramento, CA 95825; (916) 920-1939. **CIRCLE 159**

Color Invaders

Computerware introduced its Color Invaders on cassette for the Radio Shack Color Computer. The player can destroy invading ships and aliens at eight levels of play.

Color Invaders is available in two versions: Invaders-PP requires 16k, Power Pack and sells for $19.95. The Invaders-16 requires 16k but no power pack, and sells for $24.95.

For more information: Computerware, Box 668, 1472 Encinitas Blvd., Encinitas, CA, 92024; (714) 436-3512. **CIRCLE 160**

SYSTEMS

Atari Utilities

Access Plus software for the Atari 800 computer is designed to promote total access to the machine. BASIC A^+ and OS/A^+ are the premier products in the series.

BASIC A^+ maintains compatibility with Atari BASIC while adding access to the Atari system of Player/Missile Graphics. BASIC

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Centronics 737	828	Centronics 779	1068

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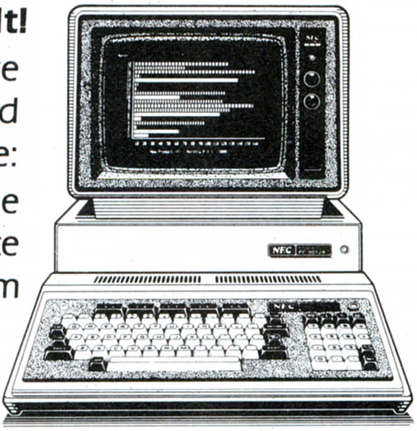

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A$^+$ has business-oriented features, such as print using, record I/O and binary I/O.

OS/A$^+$, a system command processor, allows both batch and interactive commands of virtually any complexity, the company says. Included is a selection of disk file utilities.

For more information: Optimized Systems Software, 1037 Landsdale Ave., Cupertino, CA 95014; (408) 446-3099. **CIRCLE 161**

IBM Option

The IBM 3740 option to the Oasis operating system can read and write IBM 3740-formatted diskettes on any 8-inch floppy disk system. Compatibility features include bidirectional data transfer, full directory manipulation and ASCII/EBCDIC conversion.

Other features of the Oasis operating system include compatible single and multiuser versions for up to 16 operators; security and accounting controls; inter-user communications; a BASIC compiler and interpreter with re-entrant run-time module; a general-purpose text editor and comprehensive program development tools.

This conversion utility sells for $250. For more information: Phase One Systems, 7700 Edgewater Dr., Suite 830, Oakland CA 94621; (415) 562-8085. **CIRCLE 162**

Energy Management

ENERGY BASIC is a language designed to simplify the implementation of energy management systems and similar applications requiring the monitoring of time, elapsed time, temperature, kilowatt demand, digital inputs and the control of devices based on such information.

It works as an interpreter that provides the BASIC language constructs, including FILL, FOR, GOTO, GOSUB, IF, INPUT, LET, LIST, NEXT, OUT, PRINT, RETURN, REM, RUN, STOP, WAIT, ABS, CALL, EXAM, INP, RND and SIZE.

It supports a primary system console device, an optional system printer and an optional originate/answer modem.

EB010 and EB080 are both priced at $195. A user's manual is available separately for $20. For more information: International Data systems, Inc., P.O. Box 17629, Dulles International Airport, Washington, DC 20041; (703) 661-8442.
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CIRCLE 93

NEW LITERATURE

Microsoft Catalogs

The new Microsoft consumer products catalogs are being distributed to Microsoft dealers.

The large catalog offers detailed information about software packages, their applications and system requirements. The smaller end-user catalog is a guide with capsulized descriptions of each Microsoft product and its specifications.

For more information: Microsoft Consumer Products, 400 108th Ave. N.E., Suite 200, Bellevue, WA 98004. **CIRCLE 164**

PET Interfacing

PET Interfacing, a 262-page book by Dr. James M. Downey and Steven M. Rogers, instructs the reader in building and using interfaces for the PET microcomputer.

This is a how-to book with examples, experiments and software and circuit details.

PET Interfacing sells for $16.95 plus $1 shipping and handling. Virginia residents must add 4 percent sales tax. For more information: Group Technology, Ltd., P.O. Box 87, Check, VA 24072; (703) 651-3153. **CIRCLE 165**

Software Catalog

Monument Computer Service has released its free Summer-Fall Software Catalog, featuring products specially prepared to operate on the Apple /// computer. There are also many new or improved educational products for the Apple II and Apple II Plus computers.

More than 50 business, word-processing, educational and personal applications are described for the Apple computer family. Such professional application programs as medical and dental office packages and a school administrative package are also listed.

Write to: Monument Computer Service, Village Data Center, P.O. Box 603, Joshua Tree, CA 92252; (800) 854-0561 ext. 802; in CA, (800) 432-7257. **CIRCLE 166**

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Program Generators

continued from page 63

erator that handles and maintains any database of your design. As with CORP, there are certain restrictions including record length which is limited to 255 characters, and the number of fields per record, which is limited to 23. The documentation is well done and the program offers the capability to span disk drives for large data bases.

Modifiable Database

Modifiable Database and Data Reporter are both produced by Synergistic Software. The two packages have basically the same features except the Data Reporter contains a report generator.

Like CORP and PEARL, Data Reporter allows you to define a record to create and maintain a data base. Again, record length is limited to 256 characters and Data Reporter does not allow spanning of disk drives. In fact, it is memory-based and not disk-based.

The Last One

The Last One from DJ 'AI' Systems Ltd., is a program generator that, unlike the other program generators, is not data base-oriented. Instead, it provides a way of designing BASIC code to structure your program. It asks specific questions allowing the user to expand upon the program design before it generates the BASIC code. No knowledge of BASIC programming is required since all the interactive work is performed using flowcharts or question-and-answer routines.

VENDOR GUIDE

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Software Co.
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Floral Park, NY 11001
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PEARL
Computer Pathways Unlimited, Inc.
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Salem, OR 97302
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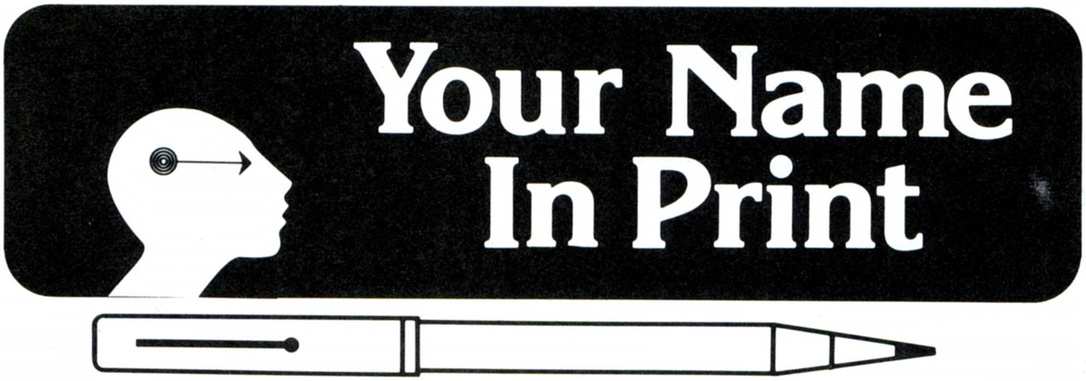
Data Reporter
Synergistic Software
5221 120th Ave. S.E.
Bellevue, WA 98006
CIRCLE 197

The Last One
D.J. 'AI' Systems Ltd.
Station Rd.
Ilminster, Somerset TA19 9BQ
England
CIRCLE 198



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continued from page 22

reading series is September 1981.

Radio Shack has also announced an agreement with QSP, Inc., a subsidiary of The Readers Digest Association, Inc., that will enable elementary schools to earn TRS-80 computers as premiums from magazine subscription sales. QSP is the largest magazine subscription sales organization in the country.

Schools interested in the QSP program should contact William E. Drake, QSP, Inc., A Subsidiary of the Readers Digest Association, Inc., Box 2003, Ridgefield, CT 06877.

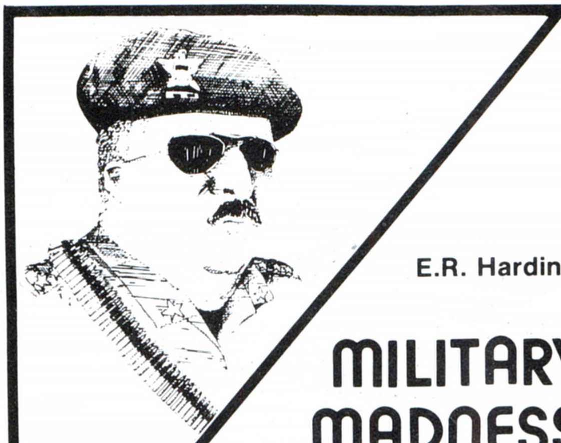
New Software For Financial Managers

Micro-DDS/Finance (DSS/F), a powerful financial modeling and planning language for the personal computer, is the initial offering in Addison-Wesley Publishing Company's new Practical Computing Series of software.

The company claims that DSS/F is slated as providing the financial manager/analyst with 90 percent of the features most time-sharing users will ever need. In its year of field-testing, it was used in a variety of large and small business settings. One billion-dollar corporation, for example, replaced its $100,000-a-year time-sharing system with DSS/F and two micro-computers. Small businesses used DSS/F to replace more limited financial planning software tools.

Financial functions built into DSS/F, providing automatic calculations include: depreciation, internal rate of return, net present value, amortization, break-even analysis, tax table lookup and tax loss carry-forward. DSS/F will calculate when is the best time to switch from one type of depreciation to another and is capable of solving simultaneous equations. It also allows the user to change data in a model without changing the model itself.

Another feature, the flexible report writer, allows the user to design reports to meet his specifications, and has automatic decimal placement reporting, commas inserted between thousands, brackets around negative numbers and centered headings—all designed to make financial reports look less like computer printouts and more like financial reports. DSS/F will also generate its own worksheets with blank spaces for needed data.



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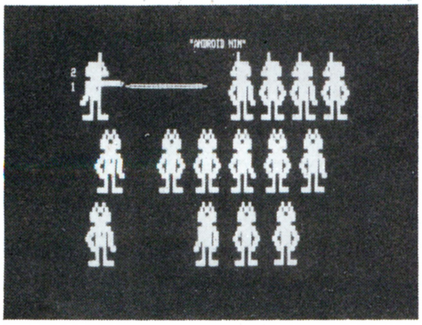

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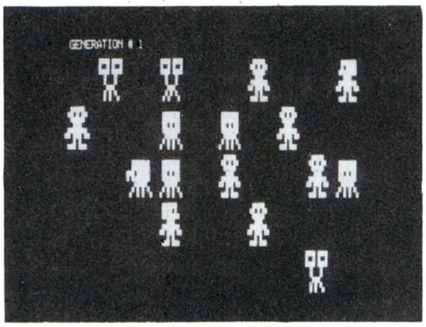

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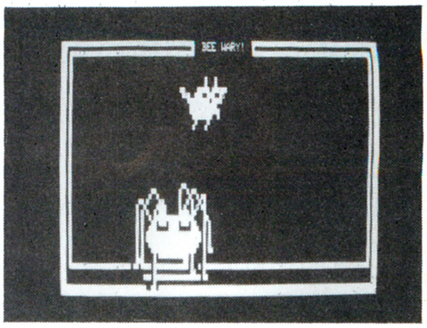

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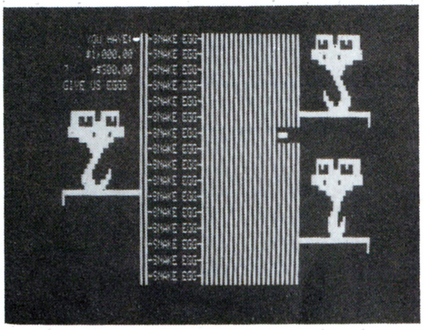

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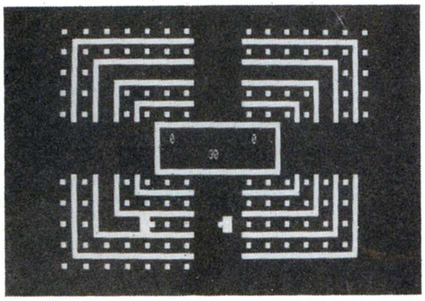

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CIRCLE 127

PROGRAM LISTINGS

Cost Proposal

This program is written for an SWTP computer.

continued from page 28

```
    SAMPLE LISTING

0010 REM ********************************
0020 REM *          COST PROPOSAL       *
0030 REM ********************************
0040 REM *       COPYRIGHT 1980 BY      *
0050 REM *      W. B. GOLDSMITH, JR     *
0060 REM *      LAKEWOOD, CA  90712     *
0070 REM ********************************
0080 LINE= 0
0090 DIGITS= 0
0100 DIM A$(7),L$(10,2),L(10,3)
0110 DIM S$(10,2),S(10,3)
0120 DIM M$(10,2),M(10,3)
0130 DIM D$(10,2),D(10,3)
0140 DIM C$(10),C(10)
0150 DIM T(5),A(4)
0200 INPUT "CLIENT NAME",A$(1)
0210 INPUT "STREET ADDRESS",A$(2)
0220 INPUT "CITY, STATE & ZIP",A$(3),A$(4)
0230 INPUT "DATE (DAY MONTH YEAR)",A$(5)
0240 INPUT "CLIENT REQUEST NUMBER",A$(6)
0250 INPUT "OUR PROPOSAL NUMBER",A$(7)
1000 REM ** DIRECT LABOR COSTS ********************
1010 PRINT "DIRECT LABOR COSTS"
1020 GOSUB 8000
1030 FOR X=1 TO 10
1040 PRINT "CATEGORY #";X;
1050 INPUT L$(X,1)
1060 IF L$(X,1)="" THEN X=10:GOTO 1150
1070 INPUT "UNITS (HOURS, DAYS, ETC.)",L$(X,2)
1080 PRINT "NUMBER OF ";L$(X,2);
1090 INPUT L(X,1)
1100 PRINT "COST PER ";L$(X,2);
1110 INPUT L(X,2)
1120 PRINT
1130  L(X,3)=L(X,2)*L(X,1)
1140  L=L+L(X,3)
1150 NEXT X
1160 PRINT
1170 INPUT "TOTAL EMPLOYER TAX PERCENT FOR LABOR",T(1)
1180  L1=L*T(1)/100
1190 PRINT
1200 REM ** SUBCONTRACT LABOR *********************
1210 PRINT "SUBCONTRACT LABOR"
1220 GOSUB 8000
1230 FOR X=1 TO 10
1240 PRINT "CATEGORY #";X;
1250 INPUT S$(X,1)
1260 IF S$(X,1)="" THEN X=10:GOTO 1350
1270 INPUT "UNITS (HOURS, DAYS, ETC.)",S$(X,2)
1280 PRINT "NUMBER OF ";S$(X,2);
1290 INPUT S(X,1)
1300 PRINT "COST PER ";S$(X,2);
1310 INPUT S(X,2)
1320 PRINT
1330  S(X,3)=S(X,2)*S(X,1)
1340  S=S+S(X,3)
1350 NEXT X
1360 PRINT
1370 INPUT "SALES TAX PERCENT FOR CONTRACT LABOR",T(2)
1380  S1=S*T(2)/100
1390 PRINT
1400 REM ** MATERIAL COSTS ************************
1410 PRINT "DIRECT MATERIAL COSTS"
1420 GOSUB 8000
1430 FOR X=1 TO 10
1440 PRINT "TYPE #";X;
1450 INPUT M$(X,1)
1460 IF M$(X,1)="" THEN X=10:GOTO 1550
1470 INPUT "UNITS (FEET, POUNDS, ETC.)",M$(X,2)
1480 PRINT "NUMBER OF ";M$(X,2);
1490 INPUT M(X,1)
1500 PRINT "COST PER ";M$(X,2);
1510 INPUT M(X,2)
1520 PRINT
1530  M(X,3)=M(X,2)*M(X,1)
1540  M=M+M(X,3)
1550 NEXT X
1560 PRINT
1570 INPUT "SALES TAX PERCENT FOR MATERIAL",T(3)
1580  M1=M*T(3)/100
1590 PRINT
1600 REM ** OTHER DIRECT COSTS ********************
1610 PRINT "OTHER DIRECT COSTS"
1620 GOSUB 8000
1630 FOR X=1 TO 10
1640 PRINT "COST TYPE #";X;
1650 INPUT D$(X,1)
1660 IF D$(X,1)="" THEN X=10:GOTO 1750
1670 INPUT "UNITS",D$(X,2)
1680 PRINT "NUMBER OF ";D$(X,2);
1690 INPUT D(X,1)
1700 PRINT "COST PER ";D$(X,2);
1710 INPUT D(X,2)
1720 PRINT
1730  D(X,3)=D(X,2)*D(X,1)
1740  D=D+D(X,3)
1750 NEXT X
1760 PRINT
1770 INPUT "SALES TAX PERCENT FOR ODC",T(4)
1780  D1=D*T(4)/100
1790 PRINT
1800 REM ** MISCELLANEOUS COSTS *******************
1810 PRINT "MISCELLANEOUS COSTS"
1820 PRINT "ENTER TYPE OF COST AND TOTAL AMOUNT."
1830 FOR X=1 TO 10
1840 PRINT "COST TYPE #";X;
1850 INPUT C$(X)
1860 IF C$(X)="" THEN X=10:GOTO 1910
1870 PRINT "TOTAL FOR ";C$(X);
1880 INPUT C(X)
1890 PRINT
1900  C=C+C(X)
1910 NEXT X
1920 PRINT
1930 INPUT "SALES TAX PERCENT FOR MISC COSTS",T(5)
1940  C1=C*T(5)/100
1950 PRINT
2000 REM ** BURDENS, RESERVES, AND PROFIT *********
2010 PRINT "ENTER PERCENT FACTORS FOR:"
2020 DIGITS= 2
2030 INPUT "GENERAL AND ACCOUNTING BURDEN",G1
2040 INPUT "CONTINGENCY RESERVE",R1
2050 INPUT "PROFIT",P1
2060 PRINT
2070  Z=L+L1+S+S1+M+M1+D+D1+C+C1
2080 PRINT "TOTAL COST IS $";Z
2090 PRINT "RECOMMENDED G&A BURDEN IS: ";Z*G1/100
2100 INPUT "WHAT G&A TOTAL DO YOU WISH",G
2110 PRINT
2120 PRINT "RECOMMENDED CONTINGENCY RESERVE IS: ";(Z+G)
*R1/100
2130 INPUT "WHAT RESERVE DO YOU WISH",R
2140 PRINT "RECOMMENDED PROFIT IS: ";(Z+G+R)*P1/100
2150 INPUT "WHAT PROFIT DO YOU WISH TO QUOTE",P
3000 REM ** PRINT SCHEDULE A - LABOR EXPENSE ******
3010 PRINT
3020 GOSUB 9300
3030 PRINT
3040 PRINT A$(1);TAB(65-LEN(A$(7)));A$(7)
3050 PRINT
3060 PRINT TAB(31);"SCHEDULE A"
3070 PRINT
3080 PRINT TAB(29);"LABOR EXPENSES"
3090 PRINT :PRINT
3100 PRINT TAB(30);"DIRECT LABOR"
3110 FOR X=1 TO 10
3120 IF L$(X,1)="" THEN X=10:GOTO 3180
3130 PRINT :PRINTL$(X,1);
3140 PRINT TAB(25-LEN(STR$(L(X,1))));L(X,1);
3150 PRINT TAB(30);L$(X,2);" AT ";
3160 PRINT TAB(45-LEN(STR$(L(X,2))));L(X,2);
3170 PRINT TAB(65-LEN(STR$(L(X,3))));L(X,3)
```

```
3180 NEXT X
3190 PRINT TAB(55);"----------"
3200 PRINT "DIRECT LABOR";TAB(63-LEN(STR$(L)));"$ ";L
3210 PRINT "EMPLOYMENT TAXES";
3220 PRINT TAB(65-LEN(STR$(L1)));L1
3230 PRINT TAB(55);"----------"
3240 PRINT "SUBTOTAL";TAB(63-LEN(STR$(L+L1)));"$ ";L+L1
3250 PRINT
3260 PRINT TAB(27);"SUBCONTRACT LABOR"
3270 FOR X=1 TO 10
3280 IF S$(X,1)="" THEN X=10:GOTO 3340
3290 PRINT :PRINT S$(X,1);
3300 PRINT TAB(25-LEN(STR$(S(X,1))));S(X,1);
3310 PRINT TAB(30);S$(X,2);" AT ";
3320 PRINT TAB(45-LEN(STR$(S(X,2))));S(X,2);
3330 PRINT TAB(65-LEN(STR$(S(X,3))));S(X,3)
3340 NEXT X
3350 PRINT TAB(55);"----------"
3360 IF S1=0 THEN 3400
3370 PRINT "SUBCONTRACT LABOR";TAB(63-LEN(STR$(S)));"$ ";S
3380 PRINT "SALES TAX";TAB(65-LEN(STR$(S1)));S1
3390 PRINT TAB(55);"----------"
3400 PRINT "SUBTOTAL";TAB(63-LEN(STR$(S+S1)));"$ ";S+S1
3410 PRINT :PRINTTAB(52);"-------------"
3420 PRINT
3430 PRINT "TOTAL LABOR EXPENSE";
3440 PRINT TAB(63-LEN(STR$(L+L1+S+S1)));
3450 PRINT "$ ";(L+L1+S+S1)
3460 PRINT TAB(52);"============="
3470 PRINT
3480 PRINT CHR$(12): REM ** FORM FEED TO TTY *************
4000 REM ** PRINT SCHEDULE B - OTHER EXPENSE ******
4010 PRINT
4020 PRINT A$(1);TAB(65-LEN(A$(7)));A$(7)
4030 PRINT
4040 PRINT TAB(31);"SCHEDULE B"
4050 PRINT
4060 PRINT TAB(29);"OTHER EXPENSES"
4070 PRINT :PRINT
4080 PRINT TAB(25);"DIRECT MATERIAL COSTS"
4090 PRINT
4100 FOR X=1 TO 10
4110 IF M$(X,1)="" THEN X=10:GOTO 4170
4120 PRINT M$(X,1);
4130 PRINT TAB(25-LEN(STR$(M(X,1))));M(X,1);
4140 PRINT TAB(30);M$(X,2);" AT ";
4150 PRINT TAB(45-LEN(STR$(M(X,2))));M(X,2);
4160 PRINT TAB(65-LEN(STR$(M(X,3))));M(X,3)
4170 NEXT X
4180 PRINT TAB(55);"----------"
4190 PRINT "DIRECT MATERIAL";TAB(65-LEN(STR$(M)));M
4200 PRINT "SALES TAX";TAB(65-LEN(STR$(M1)));M1
4210 PRINT TAB(55);"----------"
4220 PRINT "SUBTOTAL";TAB(63-LEN(STR$(M+M1)));"$ ";M+M1
4230 PRINT
4240 PRINT TAB(27);"OTHER DIRECT COSTS"
4250 PRINT
4260 FOR X=1 TO 10
4270 IF D$(X,1)="" THEN X=10:GOTO 4330
4280 PRINT D$(X,1);
4290 PRINT TAB(25-LEN(STR$(D(X,1))));D(X,1);
4300 PRINT TAB(30);D$(X,2);" AT ";
4310 PRINT TAB(45-LEN(STR$(D(X,2))));D(X,2);
4320 PRINT TAB(65-LEN(STR$(D(X,3))));D(X,3)
4330 NEXT X
4340 PRINT TAB(55);"----------"
4350 PRINT "OTHER DIRECT COSTS";TAB(65-LEN(STR$(D)));D
4360 PRINT "SALES TAX";TAB(65-LEN(STR$(D1)));D1
4370 PRINT TAB(55);"----------"
4380 PRINT "SUBTOTAL";TAB(63-LEN(STR$(D+D1)));"$ ";D+D1
4390 PRINT
4400 PRINT TAB(26);"MISCELLANEOUS COSTS"
4410 PRINT
4420 FOR X=1 TO 10
4430 IF C$(X)="" THEN X=10:GOTO 4460
4440 PRINT C$(X);
4450 PRINT TAB(45-LEN(STR$(C(X))));C(X)
4460 NEXT X
4470 PRINT TAB(35);"----------"
4480 PRINT "MISCELLANEOUS COSTS";TAB(45-LEN(STR$(C)));C
4490 PRINT "SALES TAX";TAB(45-LEN(STR$(C1)));C1
4500 PRINT TAB(35);"----------"
4510 PRINT "SUBTOTAL";TAB(65-LEN(STR$(C+C1)));C+C1
4520 PRINT
4530 PRINT TAB(52);"-------------"
4540 PRINT
4550 PRINT "TOTAL OTHER COSTS";
4560 PRINT TAB(63-LEN(STR$(M+M1+D+D1+C+C1)));
4570 PRINT "$ ";(M+M1+D+D1+C+C1)
4580 PRINT
4590 PRINT TAB(52);"============="
4600 PRINT CHR$(12)
5000 REM ** PRINT SUMMARY AND COVER SHEET *********
5010 GOSUB 7000
5020 PRINT TAB(INT((72-LEN(A$(1)))/2));A$(1)
5030 PRINT TAB(INT((72-LEN(A$(2)))/2));A$(2)
5040 PRINT TAB(INT((70-LEN(A$(3)+A$(4)))/2));A$(3)
;", ";A$(4)
5050 PRINT
5060 PRINT TAB(INT((72-LEN(A$(5)))/2));A$(5)
5070 PRINT :PRINT
5080 PRINT "YOUR REQUEST NUMBER ";A$(6)
5090 PRINT :PRINT"OUR PROPOSAL NUMBER ";A$(7)
5100 PRINT
5110 PRINT TAB(30);"COST SUMMARY"
5120 PRINT
5130  A(1)=10*INT(((L+L1+S+S1)/10)+.99)
5140 PRINT "LABOR (SCHEDULE A)";
5150 PRINT TAB(63-LEN(STR$(A(1))));"$ ";A(1)
5160 PRINT
5170  A(2)=10*INT(((M+M1+D+D1+C+C1)/10)+.99)
5180 PRINT "OTHER COSTS (SCHEDULE B)";
5190 PRINT TAB(65-LEN(STR$(A(2))));A(2)
5200 PRINT TAB(55);"----------"
5210  A(3)=A(2)+A(1)
5220 PRINT "TOTAL DIRECT COSTS";
5230 PRINT TAB(63-LEN(STR$(A(3))));"$ ";A(3)
5240 PRINT
5250 PRINT "GENERAL AND ACCOUNTING OVERHEAD";
5260 PRINT TAB(65-LEN(STR$(G)));G
5270 PRINT
5280 PRINT "RESERVE FOR CONTINGENCIES";
5290 PRINT TAB(65-LEN(STR$(R)));R
5300 PRINT
5310 PRINT "FEES";
5320 PRINT TAB(65-LEN(STR$(P)));P
5330 PRINT TAB(55);"----------"
5340  A(4)=A(3)+G+R+P
5350 PRINT
5360 PRINT "TOTAL ESTIMATED PRICE";
5370 PRINT TAB(63-LEN(STR$(A(4))));"$ ";A(4)
5380 PRINT TAB(55);"=========="
5390 PRINT :PRINT:PRINT:PRINT
5400 PRINT TAB(30);"----------------------------------"
5410 PRINT TAB(30);"(SIGNED)                      (DATE)"
5420 PRINT CHR$(12)
5430 GOSUB 9100
5440 GOTO 3000
7000 REM ** PROPOSAL HEADER **********************
7010 PRINT :PRINT:PRINT
7020 PRINT TAB(27);"COST PROPOSAL TO:"
7030 PRINT :PRINT
7040 RETURN
8000 REM ** ENTRY ROUTINE *************************
8010 PRINT "ENTER ESTIMATED COSTS BY:"
8020 PRINT "CATEGORY OR TYPE; QUANTITY;"
8030 PRINT "UNITS (HOURS, TRIPS, POUNDS, ETC.);"
8040 PRINT "AND COST PER UNIT."
8050 PRINT
8060 RETURN
9100 REM ** ANOTHER COPY? ************************
9110 PORT= 1
9120 INPUT "ANOTHER COPY",Z$
9130 IF LEFT$(Z$,1)="N" THEN END
9140 IF LEFT$(Z$,1)="Y" THEN 9170
9160 GOTO 9100
9170 RETURN
9300 REM ** PICK THE OUTPUT PORT ******************
9310 INPUT "WHAT OUTPUT PORT",P3
9320 INPUT "PRESS 'RETURN' TO PRINT",Z$
9330 PORT= P3
9340 RETURN
```

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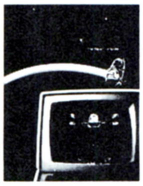

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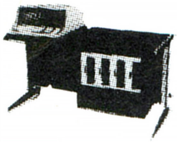

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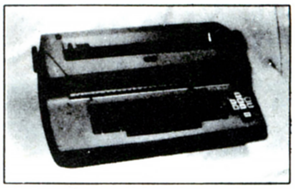

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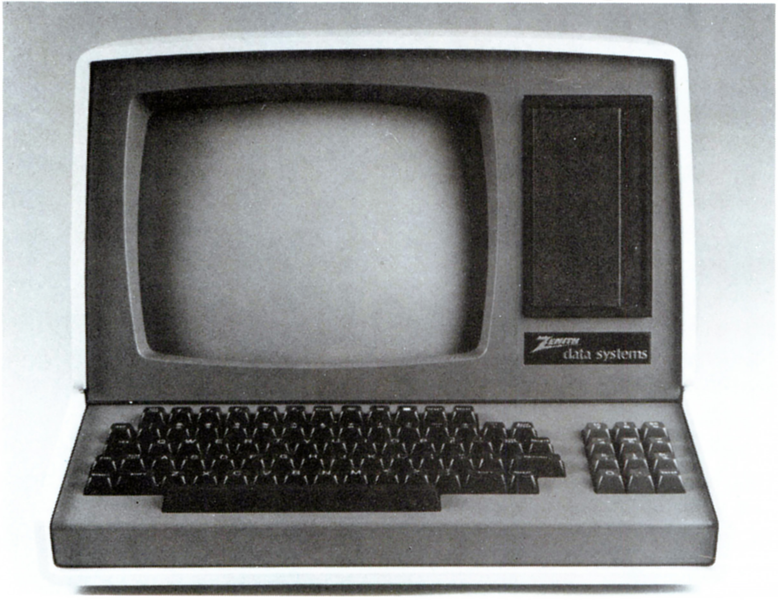

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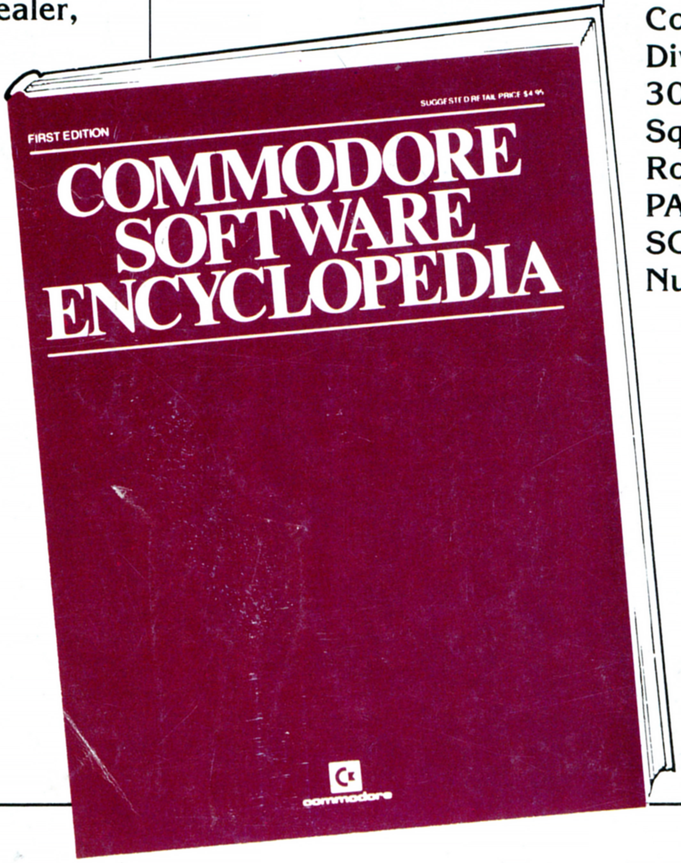
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